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# AUGIWorld

The Official Publication of Autodesk User Group International

July 2014

## Management Strategies

### *Also in This Issue*

- Revit MEP Fails and Fixes
- BIM Management Preamble
- Product Review: The BenQ BL3200PT

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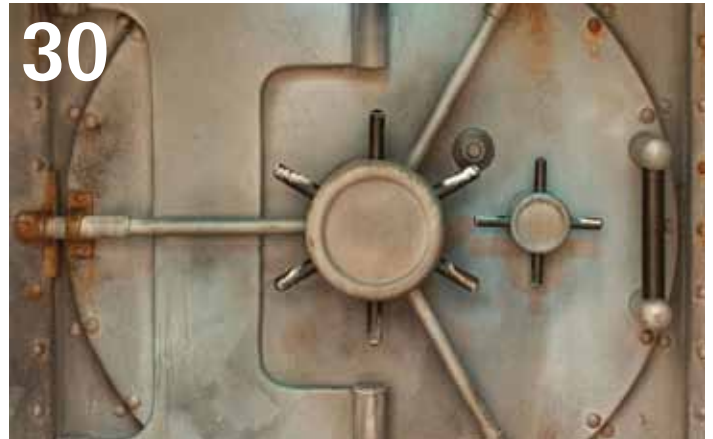
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# Letter from the President



## PLANS FOR AUGI



last month I spoke of change. Continuing in that theme I wanted to talk about a change that the Board of Directors is contemplating regarding the AUGI website.

The website has gone through several changes over the last two decades. The dust has settled from the transition from the prior management company and it is time to take a look at the website with fresh eyes.

The Board of Directors recognizes that websites need to be responsive to being viewed on a wide variety of devices. If you are like me, I view websites on my workstation, on my laptop, on tablet devices, and on my mobile phone. I suppose that I could view websites on my television too, but I'm not that sick (yet).

Think about it. What is your reaction when you go to one of your favorite websites on your mobile phone and the experience is dreadful compared to your experience on your workstation? I'm not saying that I expect your experience viewing the AUGI website on your small format devices to be dreadful. But the Board of Directors sees that there are good reasons to improve your experience across a wide range of devices.

We would love it if you were out shopping with your significant other and wanted to sneak a peek at the AUGI site on your mobile phone while your partner is in the dressing room!

With that goal in mind the Board of Directors will begin researching what it will take to achieve this goal. We will be relying on the management team that I mentioned in last month's letter to provide the Board of Directors with their recommendations, a breakdown of costs, and the expected benefits.

AUGI's Board of Directors always has the AUGI membership first in their minds. You are our highest priority. We want you to be happy with the benefits that are provided you as an AUGI member. Please reach out to the Board of Directors at [board@augi.com](mailto:board@augi.com) to tell us how you feel about a website update.

I should also mention that AUGI has begun discussions with Autodesk regarding this year's Autodesk University. Yes, it is time to begin thinking about that event. Are you making plans to attend? If so, we would love to see you at the AUGI Annual Meeting so that we can meet face-to-face and discuss what you feel is important to you as an AUGI member. We have plans to shake up the format and make the meeting an enjoyable event. We hope to see you there.

In closing I would like to say that change might be a scary thing. Or it can be a wonderful thing. Sometimes all it takes is a difference in perspective. Let us know your perspective!

R. Robert Bell  
AUGI President/Chairman of the Board

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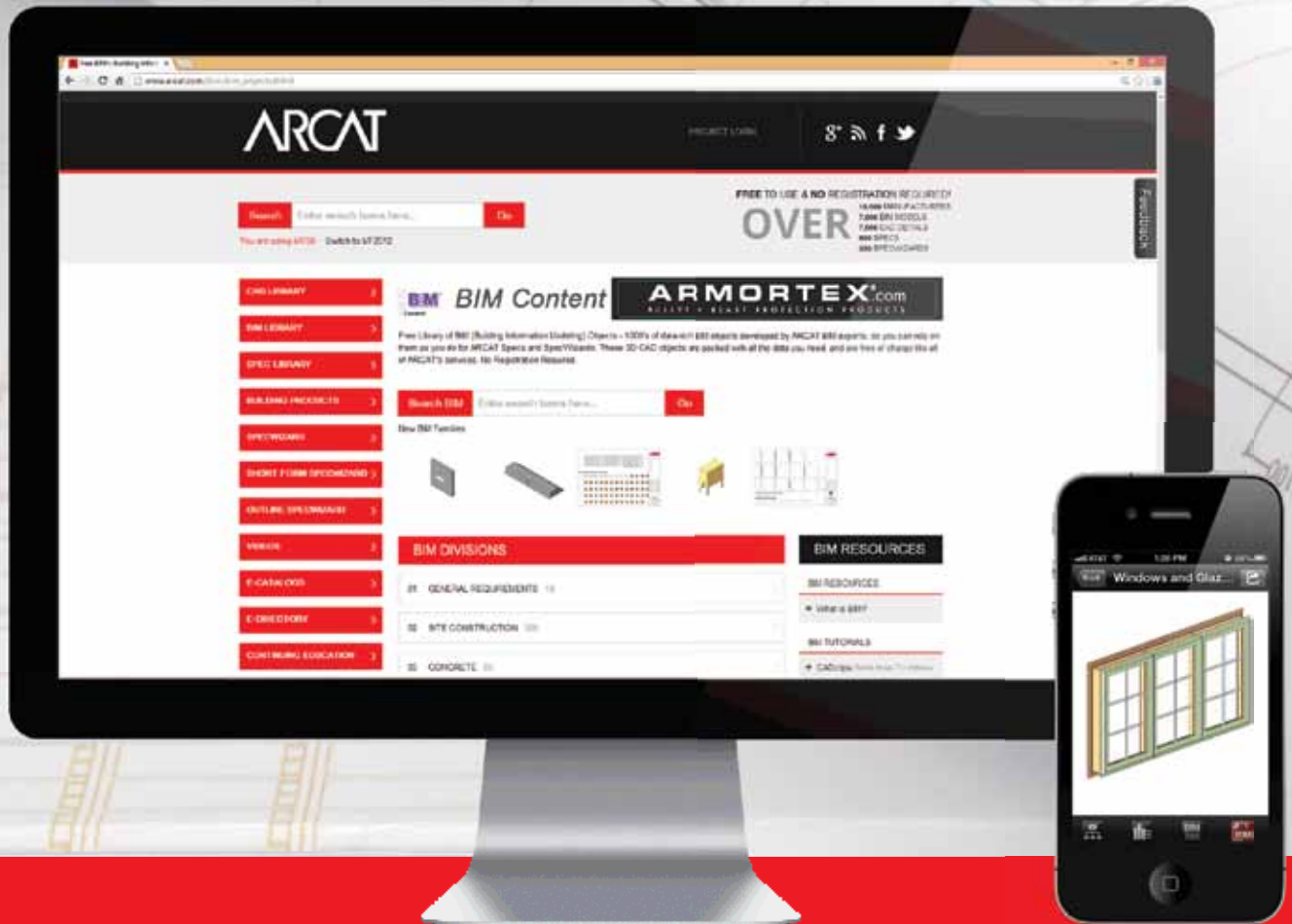
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# The Hidden Impact of NOT Having a CAD Manager



➔ **C**AD management has been around as long as CAD. In fact as soon as the second person in a firm started using CAD on the same project, there was CAD management. It may have been an informal agreement between two users regarding the name of a layer, where to store files, how to print, or the format for the deliverables. As soon as multiple people get involved in working on the same files, models, and projects, there needs to be management of the effort. This management takes time, which costs money.

No one was selected to be the CAD Manager; CAD was just managed by the people doing the work. Some firms still work that way. No single person is designated as CAD Manager. It is just assumed that people will do the right thing, in the right way, at the right time. Some firms operate this way and get the job done very well. But it is rare, and the larger the firm the more rare it becomes. When the attitude is “We don’t need a CAD Manager” or “CAD Management is everyone’s job” then the CAD production flow and dependability quickly devolves into a state of disrepair.

But is there a hidden cost of CAD management that companies think they are saving by either not having a CAD Manager or eliminating the position? What areas are impacted when no one is minding the store? What is the cost of just having everyone take care of their own stuff?

## THE IMPACT OF LOST PRODUCTIVITY

Here is a list of things that might be impacted by not having responsibility for CAD management shouldered by an individual.

### CAD Standards

I always start with this topic because it is so valuable when done right and so damaging when done wrong. Several things can happen if no one is responsible for this area. CAD standards fall into a dysfunctional state so quickly that most are outdated even when someone does have the job of overseeing them. When no one is watching, CAD standards are not followed. They are not updated. They are not understood and grasped by all users.

CAD methods become inconsistent. Everyone may think they are doing the right thing, but they are all doing something different. When a new staffer is added to a project, there is no consistent approach used that bridges the span between the last project and this one. No one tips them off as to how this project is being created.

CAD presentation is not consistent. Here is a list of things that may not be defined in a standard, but impact a set of drawings or model:

- Detail sheet layout and presentation
- Level of detail that is used in the model
- Title block text, abbreviations, and wording
- Graphic element locations (Key map, North Arrow, Graphic Scale)
- Spelling
- Logos (company and client)
- Dates and names (I have seen client names misspelled)
- Title of the submittal (Plan Check, Client Review)
- Cross reference numbers are correct
- Legibility of the drawings
- Nomenclature—callouts
- Project title block presentation and layout
- Use of 3D detail breakouts

## The Impact of Lost Progress

Other items may impact your production if no one is tasked with managing the CAD environment.

**Printing** – Someone who has not worked on the project files will have trouble printing them. They have trouble getting the right look and feel. They have trouble printing a complete set and may not even notice that something is missing on a print or a project set.

**System upgrades** – Both hardware and software tend to age as staff is focused on getting project work done and not managing the CAD environment. IT staff may understand the general demands of CAD, but most do not track the nuanced needs for hardware or the software compatibility of third-party apps.

**Customization** – Software is not customized to support the users' efforts or standards. Some of the users may grab little routines and utilities off the web and apply them to the project with negative results. Or they create tools or pen tables that link to files on a local machine. When someone on another machine tries to work with the files, they fail.

**Training** – User training is never done unless someone is pushing for it to happen. Individual voices get drowned out so that nothing happens or random training of individuals never makes a global impact.

**Project archives** – They seldom happen unless someone on the project team requires it. The CAD Manager usually has a project archiving scheme that is done for internal longevity. If there is no CAD Manager, these tend to fall by the wayside.

**Symbol libraries** – They become cluttered with useless items. Things that worked for one project, but not another. Items that are not to code, require adjustment, use the wrong layers or standards, and some that don't work at all.

## The Impact of Lost Personnel Time

In the absence of a CAD Manager, everyone has a hand in managing (or trying to manage) the systems. Project staff starts to expend hours managing the CAD process at the expense of the design process. Professional design staff is pulled into managing CAD issues and trying to fix CAD problems. The divided focus causes a downturn in design efforts that result in poor standards of quality and creativity. Users are annoyed with having to do management functions and troubleshooting. Fixing CAD corruptions and failures depletes their stamina and saps their energy.

IT staff may focus time on this effort, but long-term focus is usually lost as technology issues from other areas call staffers away from the CAD environment. Quick fixes replace long-term planning and a reactive support team soon causes a buildup of tech troubles that soon derails production.

The biggest hidden impact is in lost man-hours. By not having a full-time person focused on keeping the CAD train on the rails, you end up spending the same hours divided among several people. Splitting the hours means corrective actions may become uncoordinated and unplanned. Nothing is documented (not my job), nothing is uniform (not my trouble), and nothing is shared between projects and offices (I am not paid to help others).

The time spent is the same and the cost might actually be more if the professional level senior staff (those making more money) are called to fix CAD areas at a higher dollar cost per hour than a dedicated CAD Manager (not that CAD Managers should make less).

So we have seen the impact of not having a CAD Manager in place, and the outcomes that might take place in your firm without this kind of person on board. Keep your eyes open and see if what I have mentioned is happening at your office. What might you do to help focus management efforts for this critical design arena?



*Mark Kiker has more than 25 years of hands-on experience with technology. He is fully versed in every area of management from deployment planning, installation, and configuration to training and strategic planning. As an internationally known speaker and writer, he is a returning speaker at Autodesk University since 1996.*

*Mark is currently serving as Director of IT for SIATech, a non-profit public charter high school focused on dropout recovery. He maintains two blog sites, [www.caddmanager.com](http://www.caddmanager.com) and [www.bimmanager.com](http://www.bimmanager.com).*

# Ten Best Practices for Better Revit Performance

Revit performance is critical if you want to stave off the slow syncs, sluggish openings, and jittery model displays that can so often creep into a growing Revit file. But knowing how to achieve better performance is difficult, particularly when there is so much misinformation and superstition surrounding the issue. HP and CASE have taken a serious look at Revit's performance (HP through its HP Performance Advisor tool, and CASE through the auditing of BIM models for AECO clients). The result is 10 tips that will undoubtedly lead to better Revit performance.

## 1. ELEVATION AND SECTION FAR CLIP

Each section and elevation should have a far clip active. Set the far clip so that it only extends far enough for the correct information to show in the drawing. By activating the far clip, you reduce the data processed in generating the drawing, which gives better performance and, in some cases, better startup times.

## 2. DWG IMPORTS

DWGs are one of the primary causes of increased file sizes and reduced model performance. Where possible, minimize DWG links and imports. In an ideal scenario, DWGs should only be used for reference and then removed once native Revit elements have been generated.

## 3. EXPLODED CAD IN FAMILIES

In Revit, never explode an AutoCAD file with attached XREFs. Each XREF will be treated as an imported symbol, and even if the XREF is deleted, it will add extra data to the file that cannot be removed unless someone runs "purge unused." This extra data can reduce performance and be extremely difficult to detect. The solution is to avoid importing or exploding AutoCAD files in Revit. If it must be done, purge all XREFs before importing.

Import the AutoCAD file into a separate Revit project using the "Import from File" tool. Remove rouge line styles using CASE's [Change and Replace Linestyle tool](http://apps.case-inc.com/content/subscription-change-and-replace-line-styles) [<http://apps.case-inc.com/content/subscription-change-and-replace-line-styles>], purge the family, and then load it into your active project.

## 4. REMOVE UNUSED DESIGN OPTIONS AND VIEWS

Design options can slow the model. Even though they may not be active and visible, when changes are made within the main model, all design options have to update. To unburden the model, remove any unused design options. Similarly, maintaining unplaced views adds unnecessary data to the model. This can contribute to slow model performance and large file sizes. Unplaced views should be regularly purged whenever possible.

## 5. UNUSED FAMILIES

As the design changes, some Revit families inevitably get left in the model even when they are no longer needed. These families no longer have any functional purpose although they still contribute to the model's file size and impact model performance. The unused families should be regularly purged from the model. If they are left too long, it can become hard to remember which of the unused families are no longer needed and which of the unused families may still be used. When removing the families, be careful to only remove the family and not the unused type since a family type is difficult to reintroduce to the model once it has been removed.

## 6. MODEL LINES

Model lines appear in every model view in the Revit project. They should be used sparingly since they are easily mistaken for a drawing error in other views. Where possible, replace model lines with detail lines.





## 7. ROOM SEPARATION LINES

Room separation lines help divide rooms where no other bounding object is present. However, be careful. When these lines begin to overlap with other bounding objects, such as walls and columns, they will cause errors. The use of room separation lines should be minimized as much as possible by using room bounding elements whenever appropriate.

## 8. WORKSETS

Place Revit links into separate worksets so users can easily see which links they have opened at any given time. As more information gets added to the model, it is important to keep the model well-structured by breaking up the model into appropriate “bite-sized” worksets. A good practice is to create a 3D view for each workset and name it “workset – worksetname.” Set the visibility graphics for each 3D workset view to isolate the workset. This will provide a convenient way to visually check what is in a workset and to identify items placed in a wrong workset. Alternatively you can use the [CASE workset browser](http://apps.case-inc.com/content/client-support-workset-browser) [http://apps.case-inc.com/content/client-support-workset-browser] to see the items on each workset.

## 9. EXCESSIVE 3D MODEL DETAIL

There is always a temptation to put more and more detail into Revit families, particularly when they are being used for 3D visualizations and presentation-quality 2D documents. But if the family grows too detailed, model display performance can be negatively impacted, particularly on larger projects. There should be clear internal guidelines and best practices surrounding the creation of content. When highly detailed models are required, create high and low detail versions of the family. Use family type parameters to switch between these versions depending on the output need. Low detail versions should be extremely simple (just a bounding box that accurately depicts the shape and size) to prevent the duplication of information and the model growing too large. High detail versions can be temporarily switched for visualization and exporting to external applications. If the low quality model is not needed, you might instead include a type parameter that controls the visibility of the element.

## 10. GET PERFORMANCE ADVICE

HP Performance Advisor understands how to get the most from your hardware and software. It understands everything from the temperature of your computer, to your current GPU usage, to the RAM utilization of applications over the course of your workday. Using this information HP Performance Advisor can fine-tune your workstation without you needing to wait for help from the IT department. With one click it will identify and install the latest certified graphics drivers and optimize system and bios settings according to the software you are running. It also offers up a range of performance and diagnostic information that can help identify potential issues or areas for improvement. HP Performance Advisor is included with HP Z Workstations featuring Intel® Xeon® and Intel® Core™ processors. You can find out more at [hp.com/go/performanceadvisor](http://hp.com/go/performanceadvisor).

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## ABOUT CASE

CASE exists where building and technology intersect. We combine our experience as architects, engineers, project managers, software developers, and educators with a passion for technology to improve the way buildings are designed, realized, and operated. CASE is a building information modeling (BIM) and integrated-practice consultancy. We provide strategic advising to building design professionals, contractors, and owners seeking to supplant traditional project delivery methods through technology-driven process innovation.



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# BIM Management Preamble

Let's start with the analogy of sport, precisely ice hockey (since the LA Kings just won their second Stanley Cup in 3 years!) There are all levels—from amateur leagues all the way to the NHL, obviously. Now we may be able to assume that NHL players, especially the great ones (and the worst ones are still pretty great) get “bad” breaks, such as a referee's missed call supposedly deciding a game's final outcome, bad luck, and so on...right? Wrong.

I contend that the way these athletes deal with those situations is not to blame or make excuses; rather, they look within at what they could have done earlier or better (such as scoring more). They will then work on that, adding to their workout regimen, etc.—isn't that how they continually excel? Excuses are simply egos trying to cover the facts and there is little or no room for that if we want to excel.

If we focus on blaming others, we do not gain anything positive now or toward future projects.

Does AECO want to become top of their game?

Do YOU want to become top of your game?

Or would you, me, we rather be the fat, slow Sunday night corner league player who may have fun, but knows he is no NHL star? Great architecture, great BIM needs great players, coaches, teams!

Do you want to be a lazy architect, engineer, contractor, owner and/or user? One who knows deep down that he is shrinking away from his own greatness? I think not!

Successful BIMs take the same type of dedication exhibited in professional athletes. Period.

The further away from having the best of the best on your team, the closer AECOs are to being their profession's amateurs. And slow, too.

Pretty bold statement?

That's okay. Tell me how that is not correct. We are in a team profession and it's about time we play and work as a team: Together, each DOING his or her part! Not in words, but actions—like the greats in every walk of life. We can all be great, if we simply and truly do so.

One main distinction between the sports analogy and AECO is that BIM does not require physical athleticism; rather, we all have the tools at hand, but we just don't always use them.

What are the tools?

Technology.

Us.

When we put ego and unrealistic expectations aside, we are open to finding a solution, creating a solution. Let's create solutions with our extended teams to work toward larger successes.

## BIM MANAGEMENT OUTLINE

The following parts of a Basic Outline for BIM Process Management is a starting point of considerations for managing an Autodesk® Revit® project. Develop your own thorough processes and fully understand any BIM Guidelines, as those can make or break a project.

### 1. Proposal Stage

- ◆ Until project managers and principals are better versed in BIM and the various ranges of services that fit within the BIM process, the BIM director needs to be involved in the proposal stage. The following are some questions that need to be asked.
  - ◇ What is the client's expectation of the BIM process? Are there significant differences in scope for various levels of BIM processes that can be provided? Make sure everyone involved knows what level is being provided and budgets accordingly.
  - ◇ How will BIM be used for this project? Have all interested parties agreed on the level or state of the A&E model when it is turned over to the contractor?
  - ◇ Will Conceptual Design, Schematic Design, and Design Development be done in Revit?
- ◆ Roles and responsibilities of each party at each phase of the project need to be well defined and understood by all. Who will be involved in the development of the BIM and what are their roles?

- ◇ Owner (FF & E)
- ◇ Architect
- ◇ Civil Engineer
- ◇ Landscape Architect
- ◇ Structural Engineer
- ◇ Mechanical Engineer
- ◇ Electrical Engineer
- ◇ Plumbing Engineer
- ◇ Fire Protection Consultant
- ◇ Security Consultant
- ◇ Interior Designer
- ◇ Consulting Engineers & Designers (define)
- ◇ Equipment/Fixture Manufacturers
- ◇ Sustainability Consultant
- ◇ Contractor [**BIM capable**]
- ◇ Other (define)

- ◆ Discuss the importance of having a BIM capable contractor on board towards the beginning of the project.
- ◆ Establish basic meeting and workflow requirements.
- ◆ Limitations of BIM and Revit to budget should also be discussed with the client.
  - ◇ Discuss team consistency with the client. It is important for project team members to remain with the project (switching out contractors or others midstream is a bad idea).
- ◆ There is a definite increase in liability and work for the architect. This should be reflected in the fee and explained to the client.
  - ◇ It is feasible to get the work done faster in Revit initially, but this may not reduce the ultimate work effort required to complete the project. For example, more graphic/model information tends to lead to more questions and more RFIs from the contractor rather than reducing them, unless a strident approach is held and shared by all.

### 2. Schematic & Design Development Phases

- ◆ Kick-off with all parties that have a say in the design process. The more complex the project, the more input should be provided from project team members.
  - ◇ Define who exactly will be involved with SD & DD modeling.
  - ◇ Define who and what will be required from non-modeling entities.
  - ◇ Discuss sequence of modeling with everyone involved in the design process.
    - ◆ How is the model developed by the SMEP consultants?



- ✦ What is the state of the model when it gets handed off to consultants for their modeling process?
- ✦ Gather as much information as possible for anything that will have an impact on the design. Document when key items are missing.
- ✦ Establish milestone dates for QA reviews of the work.
- ✦ Define the state of the model file at the completion of Schematic Design for all team members.
- ✦ Define the state of the model file at the completion of Design Development for all team members.
- ◆ Establish model access and information sharing protocols.
  - ✦ How often do coordination meetings happen?
    - ✦ Provide an coordination agenda for each meeting
  - ✦ How are changes managed and executed?
    - ✦ Layout change workflow
- ◆ Schedule
  - ✦ Write schedules that consider all coordination and QA reviews, including time to resolve coordination/conflicts and comments.
- ◆ Quality Assurance Reviews
  - ✦ The model should be the priority in terms of what is reviewed. Printed drawings, PDFs are secondary. Both require thorough reviews.
  - ✦ Designate who is responsible for model and print reviews for each discipline.
  - ✦ Designate protocol for correcting software errors that will accumulate during modeling and annotation process.
- ◆ Quality Assurance Reviews
  - ✦ The model should be the priority in terms of what is reviewed. Printed drawings, PDFs are secondary. Both require thorough reviews.
  - ✦ Designate who is responsible for model and print reviews for each discipline.
  - ✦ Designate protocol for correcting software errors that will accumulate during modeling and annotation process.

## CONSTRUCTION DOCUMENTS

- ◆ Kick-off with all parties that have a say in the design process. The more complex the project, the more input should be provided from project team members.
  - ✦ Discuss sequence of modeling with everyone involved in the design process.
  - ✦ Gather as much information as possible for anything that will have an impact on the design.
  - ✦ Establish milestone dates for QA reviews of the work and who is responsible.
  - ✦ Define the state of the model file at the completion of Construction Documents for all team members.
- ◆ Schedule
  - ✦ Write schedules that consider all coordination and QA reviews, including time to resolve coordination/conflicts and comments.

- ◆ Quality Assurance Reviews
  - ✦ The model should be the priority in terms of what is reviewed. Printed drawings, PDFs are secondary. Both require thorough reviews.
  - ✦ Designate who is responsible for model and print reviews for each discipline.
  - ✦ Designate protocol for correcting software errors that will accumulate during modeling and annotation process.
- ◆ Other phases to be planned for:
- ◆ Construction Administration (model hand-off)
- ◆ As-Built models

Facilities Management (FM) COBie

Now go out there and give it everything you have!



*These are Jay B. Zallan's professional passions: An intense and experienced Virtual Design and Construction, BIM Leader, Designer, Artist, and AEC technologist. Currently heading up VDC at Harley Ellis Devereaux, Jay brings unique and qualified insights into the business and creative processes of architecture, focusing on communication and collaboration. He brings proven strategies of leveraging technologies and building teamwork toward efficient project delivery. Jay has more than 20 years of architectural experience and enjoys a varied and diverse portfolio of Architecture and Art. Jay is an Autodesk Expert Elite member, President @ Los Angeles Revit Users Group, AUGIworld magazine Revit Editor, and Graphic Standards' BIM Advisory Board. He is a speaker at Autodesk University, Revit Technology Conference(s) and lecturer on Creativity & Architecture at the University of Southern California, Cal Poly, LACMA, as well as various AIA & CSI events. Get more information about Jay at <http://jbzallan.wix.com/portfolio> or contact him at [JayZallan@gmail.com](mailto:JayZallan@gmail.com).*

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# Revit Fails and Fixes



Often Autodesk® Revit® tools lead to processes that seem like a great idea, and then suddenly turn to a dead end or a bad outcome. Having ascertained a good chunk of the program's shortcomings through experience and implemented workarounds, this article will identify common Revit fail points for MEP and explain why things aren't as they seem by showing how to do it better. By breaking down workflows and exploring alternatives, one can expose opportunities to use Revit tools and families to gain better results.

So why does Revit fail? Users often ask Revit to do something it wasn't made to do. This commonly happens when firms are new to Revit and want to apply old processes to the new tool, make it conform to classic symbology, or are just reluctant to fully commit. It's probably not the most politically correct analogy, but switching to Revit is very much like starting to a new relationship. The last thing someone should do in a new relationship is bring up what was great about the last person they were in a relationship with. Yet, it is quite common to hear how great AutoCAD is from new Revit users. The lesson is, when trying something new, give it a real chance. Don't stop a trip through the woods because a tree is in the way.

Above all, try and keep expectations in line with reality. Know that "BIM-Perfect" is a goal and "BIM Good Enough" might be where everyone starts.

## SPEED FAIL

When it comes to Revit fails, without question the number one complaint is speed. There seems to be a millions things that will affect the speed of Revit. In the absence of unlimited funds for the world's greatest computers and network, I offer the following 16 tidbits to help move the needle from turtle to rabbit.



1. Work in wireframe, not hidden mode. Use a view template to set all views back to hidden before plotting, or simply have working views and plotting views already in the template.
2. Open only the required worksets you need on open. There is a tiny down arrow next to the open button in Revit that allows users to choose which worksets to open. Unopened worksets don't load into memory, saving computing power for model navigation.
3. Reload latest before you sync. This reduces the sync time by loading the changes to the central before pushing the user's change up to the central model.

4. Purge the stuffing out of any linked Revit files. A linked architectural model can potentially have hundreds of views, schedules, and sheets that are not required for the MEP model. Purging them won't diminish the usefulness of the architectural model, but it will make it a ton smaller, and the MEP model faster.
5. Compact your Revit files once a week or more. Revit files puff up with all kinds of information. Compacting does just what one might think, having the effect one would expect.
6. If there are a lot of users accessing the central model at the same time, use the Worksharing tool or scheduled times for syncing and printing to prevent database collisions.
7. The slowest machine accessing the central brings the whole lot down. All other users must wait while a slow machine takes the time it must to sync to the central model.
8. Keep open views to a minimum. Just click Close Hidden every five minutes or so. Every view that is opened must be updated as the model is changed. Close the views to stop the madness.
9. Don't make or use over-modeled families. Adding detail that doesn't add value only adds weight to the model.
10. Have only a generic drafting view open during saves and syncs, for the same reason as number 8 above. There is not much to access and update in a generic start-up view.
11. Check and clear warnings. Revit likes it when it doesn't have to process warnings, and so will the user.
12. Keep complex sketch-based items to a minimum. When in sketch mode, keep the arcs and angles to a minimum.
13. Break your model into smaller models and link. If the model is too big, consider breaking it up into smaller models such as east and west wings, or level one and level two.
14. Restart Revit every four hours. Like all of us, Revit likes a lunch break. Completely shut down Revit to clear it from memory in the middle of the day. It will make the end of the day much nicer.
15. Work in dependent views instead of the overall view. Dependant views are usually smaller, ergo, faster.
16. Detach from central before printing. If only printing is required, detaching from central first will allow the user to print quicker by avoiding the traffic in the central model. It also allows users of the central model to work faster without the constant printing traffic.

## VISIBILITY FAILS

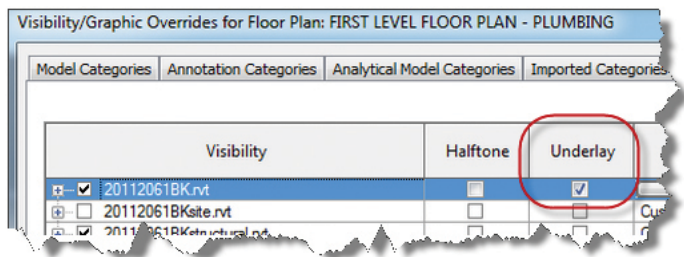
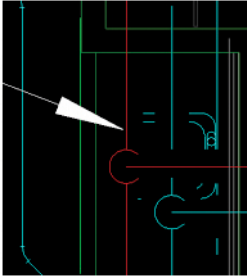
Coming in a close second to speed fails are visibility fails. For new users, having something show up wrong, not be there, or be there when it shouldn't be there is common. Visibility in Revit can get so complex, it spurred a game amongst Revit users called "Where's my chair?". A chair is hidden in a model and users compete to find the chair first. When an element refuses to show itself, use the Re-



veal Hidden Elements tool in a 3D view, select everything, then use the filter tool to isolate just the category of item you are looking for. Chances are, it will reveal itself.

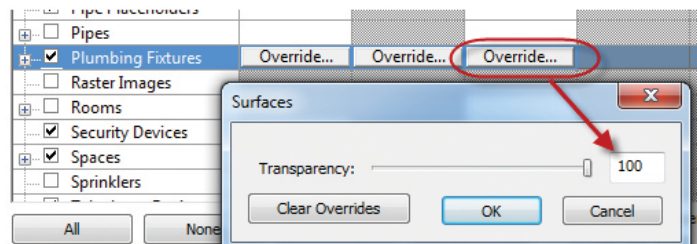
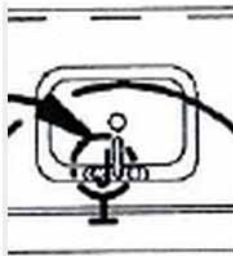
## Pipe Breaks Plumbing Fixture

When the plumbing fixtures are coming from a linked background, they can be broken by pipes or other MEP elements passing over. To correct the problem, set the linked background to underlay.



## MEP Annotation Symbols versus 3D Architectural Families

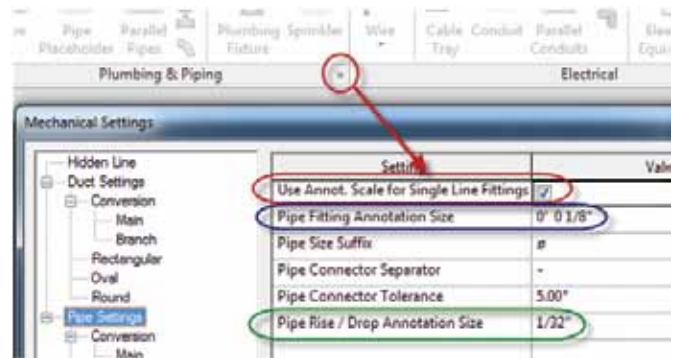
Linked models can also wreak havoc with annotation symbols in the MEP model. In this case a wall mounted junction box symbol is losing the battle with a sink underneath. To fix this issue, set the object's transparency to 100.



## Pipe Fittings Are Ginormous

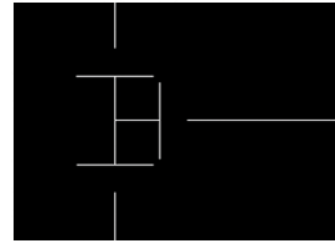
When drawing pipe in single line, fittings can sometimes be completely out of scale. To bring things back in line, go to mechanical settings

and check the "Use Annot. Scale for Single Line Fittings" checkbox, verify a respectable "Pipe Fitting Annotation Size," then set the "Pipe Rise / Drop Annotation Size" to something more appropriate.

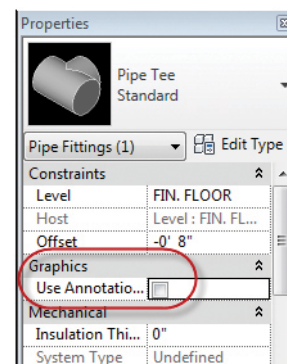


## Gaps Between Pipes and Pipe Fittings

Fittings can also have some weird affects on their connected pipes such as strange gaps in the pipe.



Unchecking the Use Annotation Scale box in the fittings instance properties usually fixes this issue. A quick way to get all similar fittings is to right-click and select all instances to change them all at once.



## Sloped Ceilings and Annotation Symbols

Ceiling hosted families don't work on a sloped ceiling. If there is an annotation, it will not show up because it is not parallel with the view plane. The 3D component will not look shortened on a sloped ceiling. There are ways of dealing with Revit's limitations.

1. Fixtures can be inserted on a work plane that is parallel to the floor. The plan symbol will be correct, but the 3D representations will be wrong.
2. A family can be created with the symbology in a generic annotation family inserted into a face-based family then nested

# Revit MEP 2014

into a new face-based family with the 3D representation. A reference plane with a slope parameter can be used to control the slope of the annotation family within the host family.

Variations of this technique can be used for fixtures that use symbols that are not drawn to scale. Examples are occupancy sensors, fixtures that use symbols that are drawn to scale and are symmetrical such as can lights, and fixtures that use symbols that are drawn to scale and are asymmetrical such as 2x4 light fixtures.

## Hierarchy of Revit Graphics

There are so many ways to change the way things look or if they are even displayed in Revit. This little code cracker tells what trumps what. It's a great way to systematically check through what might be causing the issue. The higher numbers trump the lower numbers.

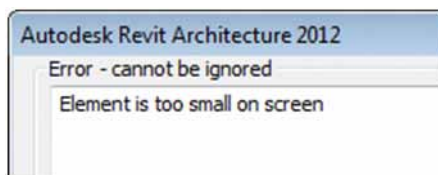
1. Object Styles
2. View Range
3. Visibility Graphics Overrides
4. Phasing Graphics Overrides
5. View Depth (Beyond)
6. View Filters (Filters nearer the top of the list override filters nearer the bottom)
7. Override Graphics in View by Element
8. View Detail Level
9. View Discipline
10. Line Work Tool
11. Worksets
12. Hide in View

## SIZE FAIL

"Element is too small on screen" is one of the most frustrating errors ever. Sooner or later users will want to draw something that Revit just won't recognize. This stems from the fact that Revit has a setting for the smallest unit of measure and it will not create something smaller than that. That being said, some things might get a user beyond that error.

1. Zoom in and try again
2. Change unit precision to 1/256"
3. Draw bigger, then scale down

If none of that works, it's time to draw something different.



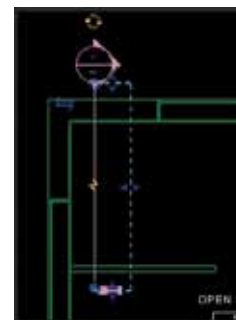
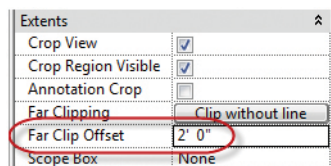
## SHARED FAIL

Linked architectural title blocks can be dependent on their shared parameters, not yours. If the architect doesn't want to share parameters, users can create a set of "dummy" parameters that can substitute for any architect's title block parameter.

1. Create a set of generic shared parameters to replace any architect's parameters.
2. Make sure the new shared parameter is a project parameter associated with sheets in the template or starter project.
3. Replace the label in the architectural title block family to use one of the generic parameters.

## FAR OUT! REVIT SECTION FAIL

Most every time a section is drawn, Revit attempts to help out by setting the depth of the section to include the farthest reaches of the model. This leaves users with constantly reigning in every new section drawn. A quick way to deal with far out sections is to simply input a respectable Far Clip Offset in the properties dialog with the section is created.



These tips should help users overcome some of the most common "failures" of using Revit for MEP.

There is no doubt that many more failures await Revit users. That's life, and is not confined to users of Revit. The secret to conquering failures is simple determination. Don't give up when Revit challenges you. Revit has been around for a good long time now. Any problem encountered has probably been lived by someone else and solved. It shouldn't take too much research to find a solution to get back on track. AUGI has brought you these answers, and there are many more stored online. I encourage everyone to search AUGI first and to consider upgrading to a Premier or Professional level membership.



Todd Shackelford is a BIM Manager for Leo A Daly, a University of Nebraska instructor, and a frequent speaker at Autodesk University. He authors two Blogs; CAD Shack and the Lazy Drafter. A Revit 2013 Certified Professional, Todd looks for missing socks when not otherwise engaged. Tweet Todd @shackelfordTodd or email him at tmsackelford@leoadaly.com



# Inside the

# Display System

**T**he display system in AutoCAD® Architecture is specifically designed so that you only have to draw an architectural object once. The appearance of that object will then change automatically to meet the display requirements of different types of drawings, view directions, or levels of detail. The view-dependent display of objects in AutoCAD Architecture is made possible by a hierarchical system of display settings that specify display properties (visibility, layer, color, linetype, and so on) for individual display components of all the different types of architectural objects under all the different viewing scenarios.

If you are a CAD manager, you will want to fully understand the display system structure and the display manager so you can modify and organize default settings as necessary to implement your own display standards. But any user can quickly change the appearance of an object in a particular view by modifying values on the Display tab of the Properties palette.

To change the display using this tab, click Select Components, select an object display component, and then select or enter a new value for the display property you want to change (such as color or lineweight). The results are immediately visible in the drawing area for the current display representation and can be applied to other display representations that use the same component.

A material definition is a group of settings for the display properties of a real-world material, such as glass, brick, or wood. The settings define how the components assigned to the material appear in every view. The materials feature works with the display system to simplify the process of customizing the display of drawings. Rather than specifying individual properties, you can control the display of objects according to the materials assigned to the physical components of the objects. In addition, if the materials change during the project, you can reassign components to the new material. Sample styles in AutoCAD Architecture catalogs con-



# AutoCAD Architecture 2015

tain predefined materials assigned to their components. You can use these materials in your drawings, customize them, or create your own materials.

The display system has three major elements:

- Display representation – controls how an individual object is displayed
- Display set – a group of display representations of objects
- Display configuration – a collection of display sets assigned to particular view directions

These three elements are hierarchical: Each display configuration contains a number of display sets and each display set contains a number of display representations. To use a display configuration, you assign it to a viewport. The objects in the viewport then use the display properties specified in the display configuration.

You use different display configurations for different tasks such as sketching and plotting. You also use different display configurations for different types of drawings such as floor plans, 3D models, and elevations. AutoCAD Architecture includes templates with predefined display configurations applied to viewports. These configurations are created for typical architectural tasks and drawing types. You can use the configurations and viewports supplied by the templates or you can modify the display system settings to suit your office standards. If you want to create your own display configurations, you can start a drawing from scratch or from a template that does not contain predefined display configurations.

## DISPLAY MANAGER

The Display Manager is a centralized location for the display system information for your drawing in AutoCAD Architecture. The Display Manager is used to create and modify display configurations, display sets, and display representations. The Display Manager window can be resized as needed to view display information. To open the Display manager, click on the Manage tab of the ribbon, Style & Display panel, then select Display Manager.

On the left pane of the Display Manager is a hierarchical tree view that organizes the display information for your drawings. You can add, rename, purge, send, and copy display system components in this area. As you select items in the left pane, you will notice that the right pane is updated (see Figure 1).

The right pane of the Display Manager contains information about your selection in the left pane. In this area, you can view display sets and mapped view directions that are associated with each display configuration. You can also view the display representations of objects and preview how an object is displayed.

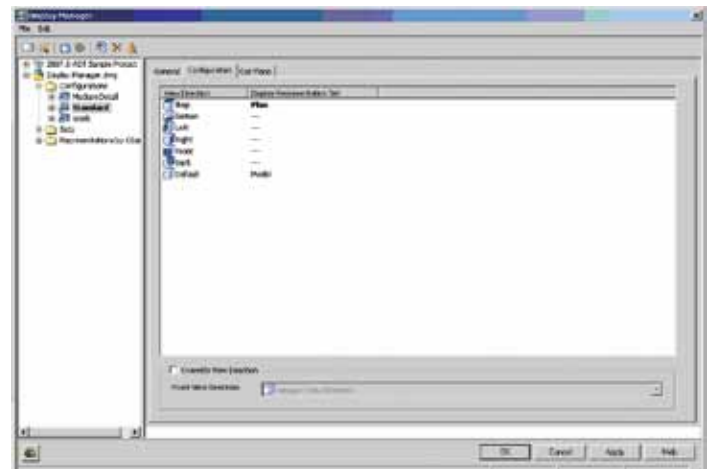


Figure 1

## DISPLAY SETS

Let's take a more in-depth look at display sets. Display sets are collections of object display representations. A display set determines which objects are visible and how these objects are displayed in different views. A display set contains display representations that are appropriate for specific tasks and/or drawing types. For example, the Reflected display set contains display representations for objects that are usually included in a reflected ceiling plan (see Figure 2).

It is possible for a display set to contain more than one display representation for an object. For example, a display set designated for plotting a floor plan might include the Plan and Threshold Plan display representations for doors. In this example, Plan display representation contains components for the door panel, frame, stop, and swing; whereas, the Threshold Plan display representation contains components for the inner and outer thresholds of the door.

If a display set does not contain display representations for a particular object, the object is not displayed when that display set is used. For example, a reflected ceiling plan's display set does not need representations for railings, which usually are not shown in these drawings.

A display set is not dependent on view direction, although it usually is designed with a specific view in mind. Similarly, a Plan display set might contain Plan display representations for a number of objects intended for two-dimensional (2D) top views. A three-dimensional (3D) model display set might contain the Model display representation for a number of objects. The display representations included in a display set depend on what representations are available for each object and whether objects need to be drawn differently from different view directions.

Drawings based on templates provided with AutoCAD Architecture contain display sets for many purposes. All drawings, including those that are not created from templates, contain

the following default display sets: Elevation, Model, Model High Detail, Model Low Detail, Plan, Plan High Detail, Plan Low Detail, and Reflected. These display sets contain display representations for each object based on the most common design situations.

To create a Display Set, begin by clicking on the Format menu, select Display manager, and expand Sets. If you want to create a display set with default properties, right-click Sets and click New (see Figure 3). If you want to create a display set from an already existing display set, right-click the display set you want to copy and click New. Enter the name for the new display set and hit Enter. Specify the display representations to use in this display set and click OK.

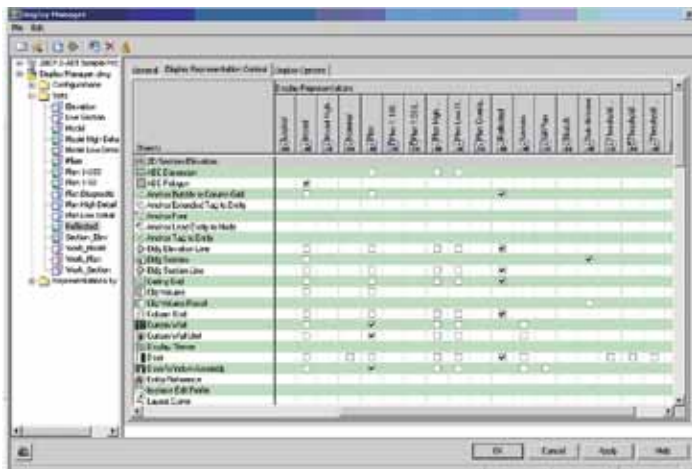


Figure 2

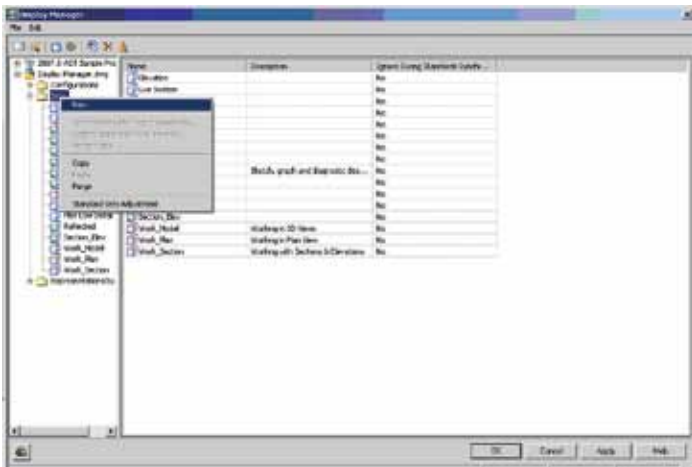


Figure 3

## DISPLAY REPRESENTATIONS

Display representations define how the components that make up an object are drawn. In traditional CAD and manual drafting, a single object such as a door is typically drawn multiple times in different drawings. In these drawings, each instance of a door is a separate collection of linework. In AutoCAD Architecture, you can create an object that changes the way it draws itself depending

on the display representation used to represent that object. Many AEC objects are made up of individual components. Each component of an object has both physical and graphical properties that help to determine the display representation of that object. The physical properties of an object control height, width, location, and shape of the object in the drawing. The graphical properties control visibility, color, layer, and linetype.

The physical properties of an object are typically decided when you create it. For example, you specify the size of a door and its location in a wall. The graphical properties of an object are controlled in its display representation. Multiple display representations can be defined for the same object.

All AEC objects have predefined display representations. Most objects have Plan, Model, and Reflected display representations, because these are the most common design situations. Other objects have only a General representation because the display of these objects does not change in different views.

A single object can be drawn in several ways, depending on the needs of each drawing type. For example, the Plan display representation draws the door panel, stop, frame, and swing components (see Figure 4). The Nominal display representation draws the door panel, frame, and swing components. Even though both representations draw the door panel, each draws it differently. The Plan representation draws a door panel as a rectangle, while the Nominal representation draws it as a single line.

The display representations available for an object and the names of those representations are based on the ways that you might need to view the object. Display representations can include different components of an object or additional display options.

To create a Display Representation for an object, begin by clicking on the Format menu, select Display Manager, and expand Representations by Object. Select the object for which to create the new display representation. In the right pane of the Display Manager, right-click the display representation to duplicate and click Duplicate (see Figure 5). Enter a new name for this display representation and hit Enter. The new display representation will have the display properties of the representation you just duplicated. Please note that the display representation created in the right pane will not be listed in the Representations by Object directory in the left pane until you close and reopen the Display Manager. Double click the new display representation to edit its properties and then assign the display representation to the display sets in which they will be used. When finished, click OK. You can also click Apply instead of OK to save the changes and continue working in the Display Manager.

To edit a Display Representation, begin by clicking on the Format menu, select Display Manager, and expand Representations by Object. Next, expand the object that contains the display representation you want to edit and select the display representation to edit (see Figure 6). The display properties you can edit will depend on the object and the display representation that you select. Select

# AutoCAD Architecture 2015

the Layer/Color/Linetype tab in order to change the AutoCAD properties, including the visibility of the object components and whether their display is controlled by the material assignment. If applicable, select tabs such as Hatching or Other to change object-specific display properties. When you finish editing display properties, click OK.

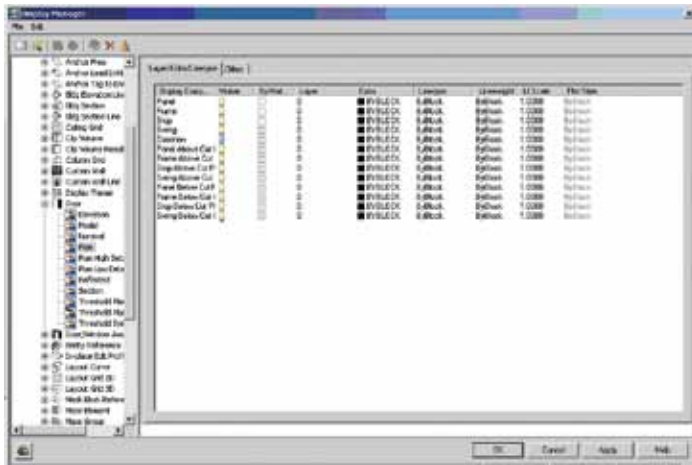


Figure 4

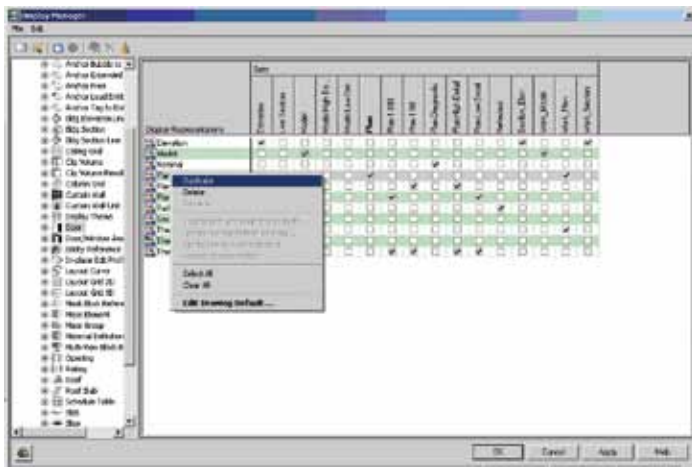


Figure 5

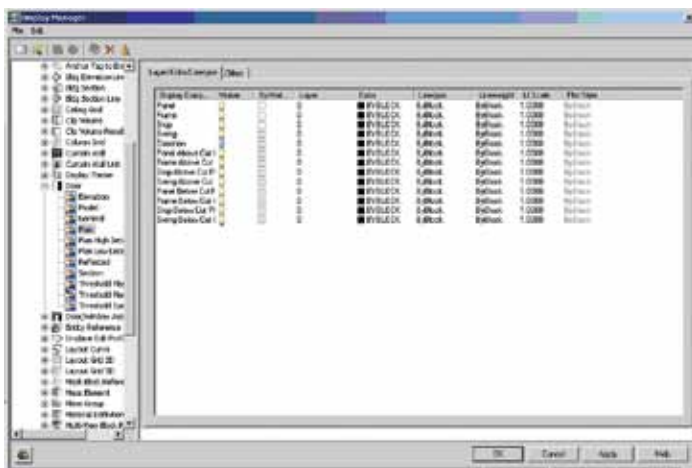


Figure 6

## DISPLAY CONFIGURATIONS

A display configuration is basically a collection of display sets assigned to view directions. A display configuration is created for a specific design task or drawing type. To use a display configuration, you need to assign it to a viewport. Drawings based on templates provided with AutoCAD Architecture contain layout tabs with viewports to which appropriate display configurations are assigned. You can use the configuration assigned to a viewport, assign a different one, or customize the configuration.

You can identify the display set assigned to each view direction using the Display Manager. In the Display Manager, the active viewport in the drawing is assigned the Medium Detail display configuration. In the left pane, the display sets used are listed below the configuration name. An icon next to each display set indicates the view direction to which the display set is applied. The Configuration tab in the right pane shows the view direction to which each display set is mapped.

The display configuration, the current viewport, and the object interact in the following manner to determine what is shown in a viewport:

- The active viewport has a current view direction and a current display configuration.
- The display configuration has one or more display sets and uses the display set that is assigned to the current view direction.
- The display set has associated display representations and it selects the representation associated with the object that needs to be shown.
- The object is shown in the active viewport using the appropriate display representation and display properties.

The display configurations in a drawing depend on the template used to create the drawing. A drawing that is not created from a template contains the Standard display configuration, which includes the Plan and Model display sets.



Melinda Heavrin is a CAD Coordinator & Facility Planner for Norton Healthcare in Louisville, Kentucky. She has been using AutoCAD Architecture since release 2000. Melinda can be reached for comments and questions at [melinda.heavrin@nortonhealthcare.org](mailto:melinda.heavrin@nortonhealthcare.org)



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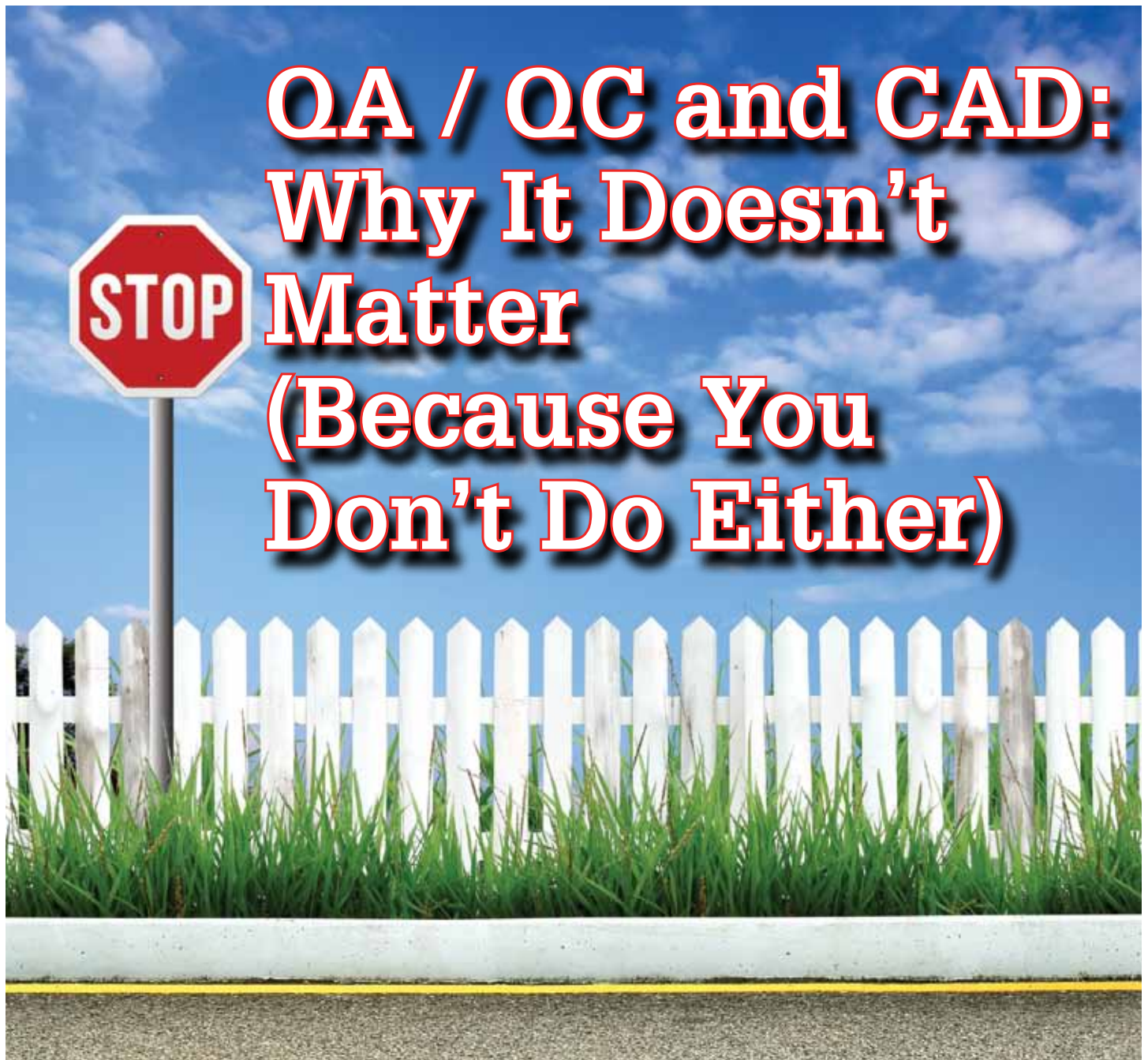
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**➡ T**his is a letter to CAD managers in the production world.

Actually it is more than that. This is a letter to CAD managers, project managers, engineers, architects, CEOs, and anyone else who is involved in the production of design projects.

It's a letter with a simple message: Stop worrying about "QA / QC." That makes it a letter that is contrary to everything the industry tells you. Just stop.

Stop worrying about "quality assurance" and stop fretting over "quality control." Why? The answer is simple: You should stop worrying about "QA / QC" because you don't do either.

Oh sure, you *think* you have some sort of QA / QC plan, but do you? Have you ever really sat down to document this scheme that will ensure that every plan set that leaves your office is perfect? Have you ever executed this plan to guarantee that every cost estimate is free of errors? Probably not.

Now ask yourself this: Have you ever been in a meeting to discuss an issue related to a problem sheet that made its way to the construction site? Have you ever been called into a conference call with your boss and/or a client regarding a cost overrun because of a "1" that should have been a "7" on the cost estimate, which resulted in thousands of red dollars? I am willing to bet that more than a few of you have.

I am also willing to bet that you had the “QA / QC” chat after that. “Well CAD manager, who was checking the sheets?” “You, project engineer, did you double/triple/double-double check these numbers?” And of course this is where someone puts on their paper management hat. That would be the one that is disposable and only comes out when there is trouble. “How do we prevent this in the future?”

How, indeed.

## THE DIFFERENCE

First of all, it would do you well to realize that “prevent this” is not a plan. Furthermore, it would do you an even better turn to realize that what you need is a process, not a plan. So what is the difference?

I’m glad you asked.

Allow me to say that I have no interest in what Webster’s or the Oxford English Dictionary has to say on the matter. This is a discussion of practical application and in practical application, a “plan” is some ethereal thing that you make up and “plan” to do. Usually the plan is triggered by some catastrophe happening and the “plan” is remediation. In the very best scenario, the plan is put into action just long enough for someone to feel that the red danger light has turned off and now we can all go back to what we were doing. That of course assumes that the “plan,” will continue to be carried out. Naturally that will not be the case.

Plans, by the very nature of how people think of them, are things that start and finish. You “plan” to rob a bank, but at some point you’re done robbing it. You can only rob that bank so much before you are stealing the doors off the cabinets. What is the point of that? No, in the minds of everyday, busy people, plans are single-use, time-limited events that have a beginning and an end.

Now, let’s say you plan to rob a series of banks. In fact, you plan to rob a bank every week for the rest of your life. Well then, assuming that you do not run out of banks, you have transformed your plan into a process, because a process is something that runs in the background. To most people, a process starts and just goes on and on like a Mobius strip or uroboros. But more importantly, a process DOES something—it has an effect on the world.

A plan? Well a plan is what you make when you “plan” to do something, but do not actually DO it.

What we, as individuals and industries, need to prevent dramatic and even not-so-dramatic errors is a process.

## SO WHAT DOES IT ALL MEAN?

You might be wondering what the difference “plan” and “process” have to do with “QA” and “QC.” On the surface, very little. That is, until you realize that most people do not understand the difference between quality assurance and quality control. In fact, a huge segment of the population may not even know there is a difference. They just assume that “QA / QC” is one thing.

In application, quality assurance and quality control are two very different things.

Quality assurance is a system or set of checks put in place to guarantee that the processes used in production are as flawless as possible, thus producing as few errors as possible. For CAD managers this means ensuring that everyone understands the intended goal, that company standards (which are a form of QA themselves) are followed, standard details are used, and training is consistent and up to date. For engineers or architects, quality assurance takes the form of understanding current design trends, following building code regulations, using valid and applicable calculation methods, and maintaining a clear line of communication to the client.

There are as many examples of what quality assurance can mean as there are people who can and should employ methods of quality control. However, in every case, it is an ongoing process.

Quality control, on the other hand, has nothing to do with the production method. In fact, with few exceptions, quality control has no place other than after the finish line. That is to say that you perform quality control after something is produced so you can “control its quality” before you ship to the client.

One could argue that quality control is carried out through the life of a project. In reality, if you look very close, what is happening is quality control that is performed as some sub-processes produce a component of the overall project. For instance, you may, and should, have quality control checks for the elevations of a new house plan project. That is QC performed as elevations are completed in the “produce elevations” sub-process. But until there is something to check, you cannot quality check.

Like quality assurance, quality control is an ongoing process that should span across the full range of your firm’s projects. These are things we do, and we do them forever, not just for this project or the next.

## WHAT’S IN IT FOR YOU?

Isn’t that what we all want to know? What does knowing the difference between quality assurance and quality control do for you? For that matter, what good is it to know the difference between a plan and a process? Because knowledge is power! No, really.



# AutoCAD

Now that we have a firm understanding of all four terms, we can begin to paint a portrait of how they fit into the frenetic existence that is the day-to-day life of most design firms.

## PUTTING IT ALL TOGETHER SO IT DOESN'T FALL APART

Let's all assume that, at some level, you participate in the design production process. That is to say, you are a CAD professional, CAD manager, project manager, engineer, or architect. Your daily lives, at work anyway, revolve around reliably creating error-free designs and delivering them to your clients.

In order to achieve this state of error-free delivery we must plan to create processes for quality-assured production. I say processes because no design is created in a single phase and every phase of design deserves its own process, if not multiple processes. We must also plan to create separate processes to control the quality of the designs delivered to our clients.

Making the effort to create and document these processes may seem like an overhead cost, and it is. More than that, this is a preventative cost. This is money well-spent to create an environment directed towards the creation of error-free documents that are delivered on time to pleased clients.

Enacting these processes is not without effort. It is like a diet for your design document production. That means that it takes directed effort that is not without sacrifice. That means it must be a steady, continued effort that will yield slow, but positive results. This is how we remove the superfluous fat that is weighing down the quality of our work. And no, it isn't easy.

Taking production samples from the CAD room and assuring their correctness and quality is the responsibility of not only the drafter, but the CAD manager and the project manager. This is not some aspect we can just assume is being done. The continued sampling of the documents produced by our CAD staff cannot be limited to the CAD manager alone, but should also include the project manager and project engineer. Quality assurance is a task that rests on the shoulders of many people.

In contrast, controlling the quality of the documents sent to your clients is a task that must be narrowed. While a single document or design element may be sampled multiple times, it should not be applied to every document. A scope that wide would bring production to a halt. Quality control, however, is a task that must be applied to every document, but only once, as the document reaches a finished state. For this reason it is both reasonable and wise to choke quality control down to the fewest possible people. This is the surest way to maintain a continuity not only throughout a set of documents, but also across many projects. This continuity is the brand by which your firm will come to be known.

## AND NOW?

So a plan is how we decide to, and in fact, *develop* a process. The process is how we execute quality assurance in the development of design documents. The design documents that travel through quality control will emerge error-free and of the highest quality possible. And it is this work that establishes your brand which, in turn, brings new work to your firm.

The difference between quality assurance and quality control is a subtle one, but still important. So is the difference between the applicable meaning of plan and process, in the context of document production. With the understanding of those four simple concepts you have the basic framework by which to reimagine the place you work, the way you work, and the product of your work.

Now stop worrying about QA / QC and do something about it.



Based in Houston, Texas, Curt is a CAD Coordinator for a civil engineering firm and the owner and editor of the Kung Fu Drafter blog. He began using AutoCAD with Release 10 and has spent the past 20+ years working with various Autodesk products including AutoCAD, Civil 3D, Map 3D and SketchBook Designer. Curt is also a freelance content creator, featured Autodesk University speaker, and training content developer. In his spare time Curt writes, games and spends time with his dog and horses.



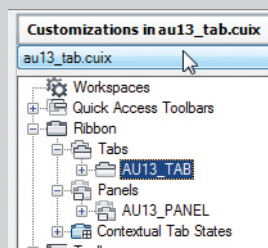
## And Here's How to...

### Export/Import Your Custom Tab Content

To retain the integrity of the AutoCAD® 2015 menu structure, all you need to do is Export your custom Tab from a previous version, then Import it into A2015. When exporting your customized tab, the key is having a **target** location for the tab. That target location will be a new customization file, .CUIX, created from the Transfer tab of the CUI.

#### How to Export Your Custom Tab for Transfer to Another Version or Computer

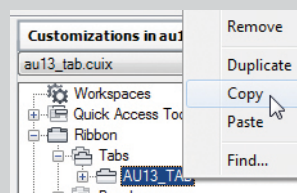
1. Launch the version of AutoCAD with the custom Tab that you want to transfer, then open the CUI.
2. On the *Customize* tab, navigate to your custom tab—hopefully under *Partial Customization Files > CUSTOM*—then right-click on your tab and click *Copy*.
3. Click the *Transfer* tab. [The next couple steps are, curiously, necessary.]
4. Expand *Ribbon*, then right-click on the *Tabs* node and click *New Tab*. Press [Enter] for the default name 'New Tab.'
5. Right-click on *New Tab*, then click *Paste*. Your custom tab will appear under the *Tabs* node (along with *New Tab*). Now, right-click on *New Tab* and *Remove* it.
6. Now click the small *Save the Current Customization File* button to open the *Save As* dialog box. Give it a name and click *Save*, then click *OK* to close the CUI and save your changes.



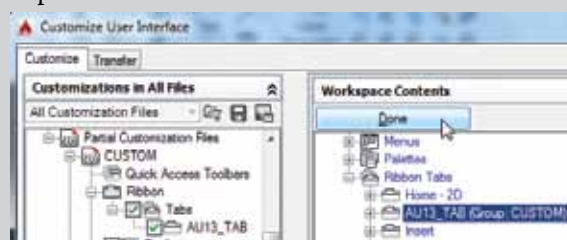
At this point, you have saved a .CUIX containing a custom tab with a custom panel. The next step is to open that file in the target computer or version [A2015 perhaps].

#### How to Transfer Your Custom Tab to Another Version or Computer

1. Open the CUI in the target version/computer, then click the *Transfer* tab.
  2. Click *Open Customization File*, then navigate to and *Open* your custom .CUIX.
- Note: If you saved a .CUI file from A2009 or prior, change the Files of Type to the Legacy file of .CUI to see your customization file in the *Open* dialog box.
3. Expand *Ribbon*, then *Tabs*, right-click on your custom tab, then click *Copy*.



4. Click the *Customize* tab, then navigate to *Partial Customization Files > CUSTOM*.
5. Expand *Ribbon*, then right-click on the *Tabs* node and click *New Tab*. Press [Enter] for the default name 'New Tab.'
6. Right-click on the *New Tab* node, then click *Paste* to paste the tab copied from Step 3, above. Now you can right-click on *New Tab* and *Remove* it.
7. To associate the imported tab with a workspace, under the *Workspaces* node, click the name of the *Workspace* where you want this tab to live.
8. Under *Workspace Contents* on the right, click *Customize Workspace*.
9. Under *Partial Customizations Files > CUSTOM > Ribbon > Tabs*, put a check in the box beside your new tab. You will then see your new tab listed in your *Workspace Contents*.



10. To see your tab on the ribbon, click *Done*, then click *OK* to apply and close the CUI.

Hopefully you now feel a bit more confident about retaining your customization files ... *I know I certainly do!*



Michael E. Beall (B. Arch.) won the AU 2013 Speaker Award for Hands-on Labs and is an Autodesk Authorized Author. He is the owner of CAD Trainer Guy, LLC in Shelbyville, KY and has been presenting onsite CAD training around the planet since 1982. Contact him anytime at [michael.beall@cadtrainerguy.com](mailto:michael.beall@cadtrainerguy.com), on LinkedIn at <http://www.linkedin.com/in/cadtrainerguy/> or give him a call at 502.500.2267.



# Focus on Monitors: The BenQ BL3200PT

**I**n every architecture, engineering, and design firm there is a conversation going about hardware. Whether they are open expressions or hushed complaints, comments regarding the selection, performance, and cost of CAD hardware is a matter that is never far from the minds of those in our industry. In fact, the hardware discussion of “what to buy and how much does it cost” is second only to similar discussions about software. And why not? The categories of CAD hardware and software are in constant flux.

Still, with all this discussion, there is one category of hardware that rarely gets much attraction or traction: the monitor. Oh sure, CAD professionals always want bigger monitors and executives rarely want to pay for bigger monitors. Why should new monitors be above the consideration for faster processors and more memory? Because there is something new, that’s why. There is a breed of monitor not only larger and sleeker than other displays, but also specifically designed for the CAD / CAM industry.

Now, there is something worth talking about ...



## GENERAL IMPRESSION

At first sight, the BL3200PT from BenQ is impressive. The size of the box leaves no doubt that it is a big piece of equipment. This is one massive container and once you open the carton it is clear that this is also one massive and impressive monitor. Once assembled, the BL3200PT lives up to the initial impression with a presence that would dominate any desk on which it sits. Even sitting on my full-sized drafting table, this monitor demands attention.

The industrial design of the BL3200PT is sleek and efficient with a nice slim bezel. That can be said for a great number of displays today. However, what other displays cannot claim is that they are specifically designed to maximize CAD/CAM performance while minimizing eye strain for CAD professionals.

After just a few days of living with the BL3200PT there was no doubt in my mind that this was a great monitor.

## RESOLUTION

The BenQ BL3200PT brings an impressive 32" wide, LED backlit display with a maximum resolution of 2,560 x 1,440 (WQHD) to the table. BenQ's ZeroFlicker technology ensures that this big, bright screen is free of the standard flicker-related issues that plague so many other LED monitors on the market. This unique technology adds greatly to the comfort level of working with the BL3200PT.

Not only is this massive display impressive to see, it is impressive for CAD professionals to use with a custom-designed, high-contrast CAD / CAM mode. This provides CAD professionals with a mode of display that helps to distinguish design linework easily and clearly. While other monitors claim to have similar performance through the use of specialized displays or custom color profiles, these were one-way solutions. Many users soon learned that "CAD mode" was not optimal for other uses.

CAD professionals using the BL3200PT will appreciate BenQ's solution to this "single use" dilemma: the OSD Controller. This nifty little kit plugs into the monitor and resembles a hockey puck, but rather than hit this puck, you use it to control the BL3200PT's display controls. Where other monitors set display controls into the monitor bezel, BenQ has added intuitive display controls to the OSD Controller, putting control in easy reach. This single innovation, combined with its effective and differentiated display modes, make the BL3200PT a top contender for any CAD professional's wish list.

## PLUGS AND PORTS

Power and video connections are located on the back of the monitor. However, rather than the normal backward facing connections along the bottom of the monitor, the BL3200PT places its connections along a side edge. This arrangement makes for quick and easy access to the monitor's DisplayPort, DVI-D, VGA, and HDMI

connections. Along the same side of the monitor is a collection of ports including an SD card reader, USB 3.0, and headphone jack.

## DESIGN AND ADJUSTABILITY

The BL3200PT's stand and overall appearance reflect BenQ's overall approach to both industrial design and user interaction. The unit's bezel and footing have a black satin appearance while the vertical member has a brushed aluminum look, with a very convenient location for the OSD Controller at the pivot point. All of this comes together for a very sleek, modern look.

The BL3200PT is not only easy on the eyes with its task-specific display modes, it is also easy on the neck with a wide range of adjustability. The vertical range of movement is nearly 6" and the unit has a full 90 degrees of rotation to set it into a portrait mode. This



# Hardware

is a welcome feature for anyone specializing in print document creation or editing, or anyone using the BL3200PT to create an even larger display. Using the BL3200PT as a single panel in a multiple panel display is easily achieved in landscape mode in any range of sight due to the unit's 90 degrees of horizontal rotation and 25 degrees of vertical tilt. All adjustments are easily achieved without undue effort, but also remain in place once set.

## ADDITIONAL FEATURES

Beyond task-specific display modes and the addition of Zero-Flicker technology, the BL3200PT has some great features that reduce user eye strain. The Low Blue Light technology built into this monitor will easily increase production with a reduction in the high levels of blue light emitted by many modern LCD displays that people often find difficult to work with. A few clicks on the OSD Controller and users can reduce the level of blue light emitted as much as 70 percent! In addition, BenQ has added a light sensor along the lower, front-facing bezel to measure ambient light in the workspace and automatically adjust the display's brightness to an appropriate level. Other automated features include BenQ's Smart Reminder, a unique tool to remind the user to take breaks from the display in 20, 40, 60, or 100 minute intervals.

Sound is provided by two 5 watt speakers. Whether watching online videos, listening to streaming music, or rocking the world of Dark Souls, I found the speakers up to the challenge and sounding great.

## PRICE

The BenQ BL3200PT is available now for a manufacturer's suggested retail price of \$999.

## CONCLUSION

My use of the display reveals that it lives up to its advertising—being pleasant to use and easy on the eyes. Adjustability is effortless and the task-specific “CAD mode” truly does change the display tones such that linework seems to pop off the screen. Even the thinnest, darkest lines are easily distinguishable. I have always been a fan of monitors that rotate from landscape to portrait position and the BL3200PT's image auto-rotate and cleverly placed connection ports make rotating the screen a breeze.

Whether using the BenQ BL3200PT for CAD work, document editing in Microsoft Word, or gaming, I found this to be a quality modern in both build and performance. The BL3200PT monitor is definitely one that I would recommend to anyone in the CAD field, but also anyone performing any prolonged desktop work or gaming.

I have to admit that when I was first offered the opportunity to review the BenQ BL3200PT I was skeptical. In the past I have reviewed a number of monitors from major players in the display

industry in a wide range of forms and price levels. I had my doubts that this “CAD” display, from a lesser known brand, could have anything worthwhile to offer. Having worked with the BL3200PT for several weeks now, I am a convert. BenQ is a brand to watch.

I will be looking to make the BL3200PT a permanent part of my CAD workstation.



## PRODUCT INFORMATION:

**Rating: 9/10**

32" LED-backlit LCD Monitor

Manufacturer: BenQ

Price: \$999 (MSRP)

Pros: Excellent image; CAD/CAM specialized mode; easy display control access; easily adjusted

Cons: A bit pricey for hardware class



Based in Houston, Texas, Curt is a CAD Coordinator for a civil engineering firm and the owner and editor of the Kung Fu Drafter blog. He began using AutoCAD with Release 10 and has spent the past 20+ years working with various Autodesk products including AutoCAD, Civil 3D, Map 3D and SketchBook Designer. Curt is also a freelance content creator, featured Autodesk University speaker, and training content developer. In his spare time Curt writes, games and spends time with his dog and horses.



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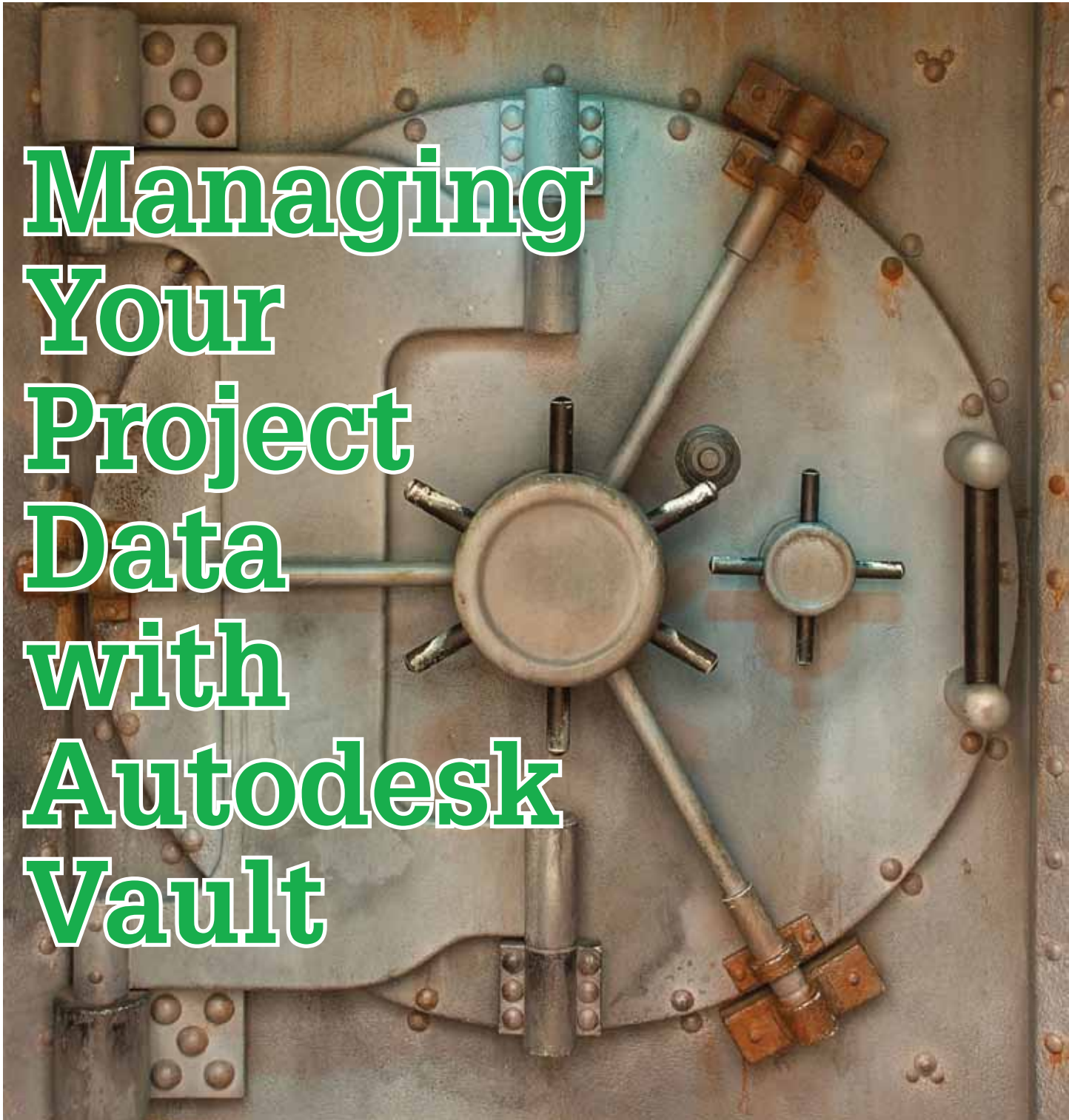
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# Managing Your Project Data with Autodesk Vault

Do you cringe at the very thought of data management? If so, you are not alone. Many people struggle with how to effectively and efficiently manage their project data. As painful as it can be at times, properly managing project data is a critical part of a successful workflow. To some degree, you likely are already using a data management process. Simply organizing your files in a Windows folder structure is a very basic form of data management.

I have seen companies use everything from an unorganized project folder structure to a custom database that must be manually updated with file location/information to manage their data. While these methods may work, how much extra work are you doing by manually entering information in a database? How much time do you spend searching for the right file and making sure it's the latest version? If you wanted to know who last edited a drawing and what they did, how long would that take you? Could you even find that information? There is a way to have all this and much more at your fingertips through efficient and effective data management with Autodesk® Vault.



With Autodesk Vault you can easily organize, manage, and track your data, quickly and easily find the latest version of a file, and view detailed information about the file and its status without having to open the file. Customize Autodesk Vault to your workflow with Lifecycle and Revision Management.

## WHAT IS AUTODESK VAULT?

Autodesk Vault is a comprehensive data management solution that can be customized to fit your needs and workflows. Direct product integration with many of Autodesk's design products allows you to easily get access to your files without having to leave the application.

Autodesk Vault runs on top of Microsoft Windows Server operating systems and utilizes Microsoft Internet Information Services (IIS) and MS SQL as the backbone of the server side application. A client side application is also installed on each client machine. The client installs a Windows Explorer-like application called Vault Explorer that provides deep access into the data, settings, etc. It also adds ribbon tabs for Vault in each compatible Autodesk application, as well as Microsoft Office applications.

Vault is a complete local solution and none of your data is stored in the cloud. With Active Directory Integration, users can seamlessly log into Vault with the same credentials they use to log into their computers. User groups can also be imported from Active Directory, allowing Vault administrators to provide access and permissions to Vault using your existing Active Directory users and groups.

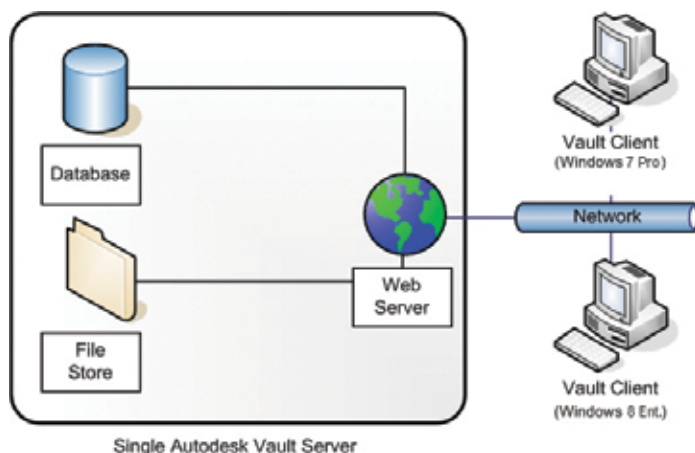
## HOW DOES AUTODESK VAULT SERVER WORK?

The Vault server comprises three main components: a Database, File Store, and Web Server. Each of these components work together to store metadata, files, and provide access to this data. A brief explanation of each follows.

**Database** – All metadata related to the files in Vault is stored in a Microsoft SQL database. It catalogs the location of each file and the metadata associated to the files. By default, Vault will install SQL Server Express. This is great for smaller environments, but must be upgraded to a full version of SQL for large or replicated environments.

**File Store** – This is a secure Windows folder structure where all files in the vault are stored. It is setup and managed by SQL, optimized for fast search and retrieval of files.

**ADMS Web Server** – Autodesk Data Management Server (ADMS), which handles and processes user requests uses Microsoft IIS to provide access to the contents of Vault.



## MULTI-SITE SCALABILITY

Vault provides flexible scalability from a single site to many sites spread across the globe. A vault environment can be configured to allow project teams from many locations to seamlessly collaborate. This can be accomplished through two different forms of replication, File Store Replication and Full Replication, which is also referred to as Connected Workgroups.

**File Store Replication** – This allows for a single SQL database to be shared across multiple locations, while the data contained in the file stores is replicated between each of the locations. This replication takes place on a scheduled interval such as nightly, weekly, etc. In between these scheduled replications, files can be replicated on demand as they are accessed. For example, if two sites are replicating file stores nightly, but during the day Site A modifies a file, then site B goes to access that file, it will be automatically replicated from site A to site B. This ensures a user is always working with the newest version of a file regardless of site location. This type of Replication is optimal for locations with low network latency.

Prior to the 2014 release of Autodesk Vault, each site required a file store and ADMS services. During the 2014 release, Autodesk released a new method for file store replication using Autodesk Vault File Server (AVFS). This is simply a replicated file store, and user requests are processed by a central ADMS server typically located



# AutoCAD Civil 3D 2015

at the same location as the SQL database. This provided a speed increase for remote sites' access time, while also cutting down on hardware requirements for remote Vault Servers. AVFS can be installed quickly and easily and does not require the level of server hardware required when also running ADMS.

**Connected Workgroups** – For environments with high network latency, full replication can be used. This utilizes multiple database servers replicating using Microsoft SQL Publisher/ Subscriber technology. This method will replicate SQL data, as well as the file stores as described above. Each group of servers that share a single SQL database is called a Workgroup. These workgroups can be connected with full replication to allow all sites from each workgroup to collaborate together.

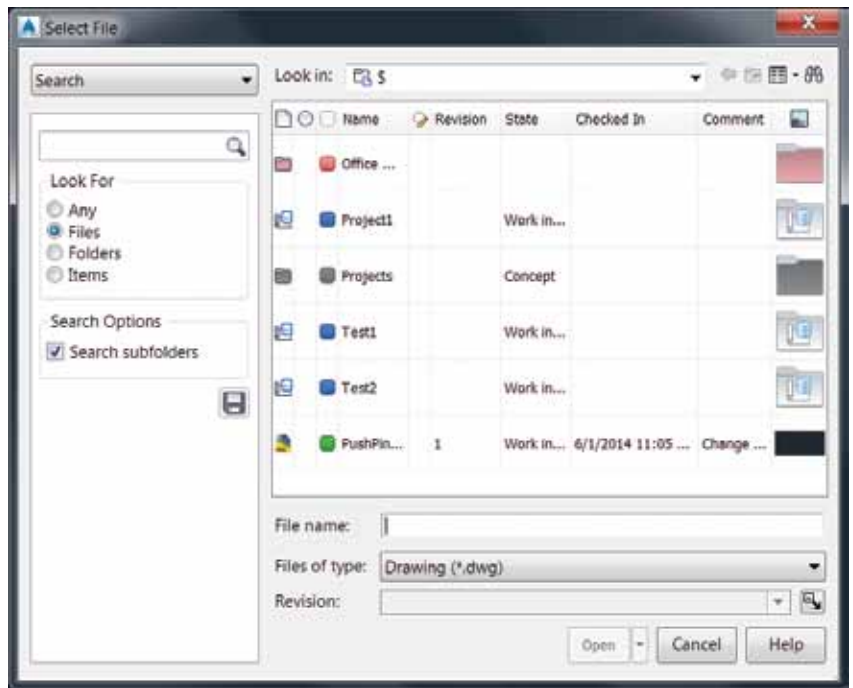
## HOW IS VAULT USED IN A DAILY WORKFLOW?

The biggest question I hear when discussing Vault is: How is this going to affect my daily workflow? Vault was created by Autodesk for Autodesk users and workflows. What this means for you is an optimized environment to allow you to work day to day in a way that is familiar to you.

Unlike other methods of data management where files are stored on a server and where a file is opened and edited over the network, Vault moves a copy of the file to your machine locally, and marks the file as "Checked Out" on the server. This means while you are editing a file, it is stored locally on your machine allowing for quick access to the file. When you have finished modifying the file, or want to save significant changes back to the server, the files are "Checked In" to the Vault, syncing any changes to the file back to the server.

With the CAD application "Add In for Vault," opening a file from Vault is accomplished through the Open button on the Vault ribbon tab. This opens a file explorer window that allows you to browse the contents of the Vault, search for files, view properties associated with the files, and open/check out the file. Once you have finished editing the file and would like to sync your changes back to the Vault server, you simply click the Check In button on the Vault ribbon tab. This will give you the option to check your changes in, but keep the file checked out to you to continue modifying.

External references are fully compatible with Vault. To add an Xref to your drawing you click the Attach button on the Vault ribbon tab in your CAD application and select the drawing you would like to reference. This will then initiate the same Attach External Reference dialog you are accustomed to. When a drawing is checked into the Vault, any Referenced drawing that does not exist in the Vault will automatically be selected for Check In to Vault. When viewing a file in the Vault client application, the Vault Explorer on the Uses/Where used tab, you can quickly see if a drawing has any drawings referenced into it or if it is referenced into any other drawings. Because the properties of



drawings in Vault, including their location within Vault, are stored in a SQL database, drawings, including those with Xrefs or being referenced in another drawing, can be freely moved to other folders or even renamed without breaking any references.

## VAULT WITH CIVIL 3D

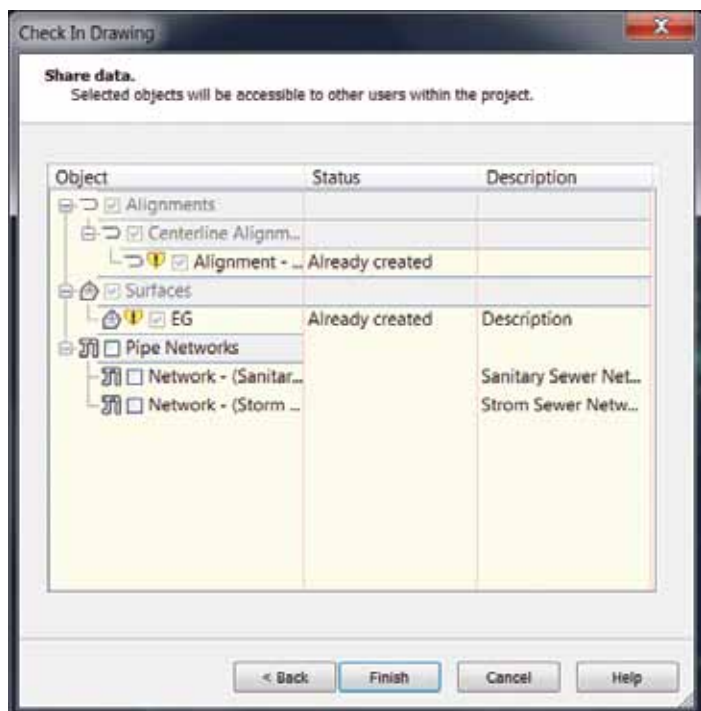
Vault was initially created for the manufacturing industry and Autodesk Inventor® in particular. It was included in AutoCAD® Civil 3D® from the 2008-2011 releases. Being included with the software, many people took advantage of this and attempted to use Vault with Civil 3D. While some were able to successfully implement these versions of Vault into their workflow, many struggled with it and were left with a bad taste in their mouths for Vault. The features and functions were biased for a manufacturing workflow and the integration with Civil 3D was lacking in many areas. This time, Autodesk has made tremendous improvements with Vault and the Civil 3D integration. Put whatever you have heard about these past releases of Vault out of your mind and give Vault another look!

Vault now fully integrates with Civil 3D including survey databases, pipe networks, data shortcuts, etc. Don't let the bad memories of past Vault/Civil 3D integration woes sway your opinions of the new highly improved versions of Vault. It is a whole new animal!

## DATA SHORTCUTS IN VAULT

When using Civil 3D with Vault, the data shortcuts process is simple, and easy to use. When you are working in a vaulted drawing and you create an alignment, surface, pipe network etc, you want to create a data shortcut for, simply check the drawing into Vault. During the check in process the object will automatically be selected and a data shortcut will be checked into Vault. With the Vault add in for Civil 3D, the prospector will have a new section called Projects. This will contain





project information for all projects you select to view from Vault. Under each project you will see sections for each type of Civil 3D objects such as surface, pipe network, etc. These will contain all data shortcuts for the project. To use a data shortcut you simply right-click on the data shortcut and select Create Reference. When the source drawing is updated, you will receive a message in Civil 3D that the reference needs to be updated.

While this process is different than what users are accustomed to, it can be simpler and easier to use than the current process. All data shortcuts are stored in Vault and are quickly found and used from the prospector. Wouldn't it be nice for this to be a Civil 3D feature in itself? This portion of Vault alone can be a very valuable addition to your company's workflow.

## TIPS FOR A SUCCESSFUL IMPLEMENTATION

**Don't Do It Alone.** Implementing a data management solution can feel like a daunting task, but with the help and guidance of a Vault expert you will get an optimized Vault environment up and running quicker. There are many components to Vault, from the vault server architecture, to replication, to optimizing your workflow with life-cycles, revisions, user defined properties, etc. within the Vault. Vault is a very customizable solution, a knowledgeable Vault expert will be able to help you understand each component and develop a configuration optimized for your workflow and environment.

I have found that companies that take on the task alone get overwhelmed with the process and end up scrapping Vault or using it in a dilapidated state. Having an expert guide you from the beginning will result in properly configured Vault environment, in less time.

**Discovery and Planning.** To successfully create a plan for Vault, discovery of project requirements, scope, and existing infrastructure will be key. Start at a high level—number of office locations involved and the number of users who will utilize the Vault. You will then need to know what kind of network latency you have between the offices, whether or not existing server hardware is capable of running Vault Server. Continue the discovery/planning process through each component. It is important to document the plan and the information discovered along the way; you may need to refer back to it.

**Test Test Test.** Before putting a Vault into a production environment, thoroughly test your configuration. I have found it extremely helpful to set up a test environment for Vault, allowing those involved to play around, change settings, and really get familiar with Vault without the fear of messing up a production environment. When you are ready to begin setting up your Vault for production, use this test environment to configure and test until you are confident with your configuration. You can then import this configuration into a production Vault.

## CONCLUSION

Vault is a comprehensive data management package capable of being configured to your needs. If you used Vault during the releases it came boxed with Civil 3D, you may have developed a bad view of Vault. Throw any of those memories out the window and give the new version a second look—it is greatly improved! Civil 3D is now fully integrated with Vault. Get the help and guidance of a Vault expert when starting an implementation. They can help you get a properly configured Vault, optimized for you in less time than going about it alone. Don't give up, and good luck!



Bryson Anderson has worked in the IT industry since 2008. During this time he has been involved in many aspects of IT including Systems Administration, Networking, Telecom, Hardware, and IT consulting. He has assisted numerous companies in a variety of industries including healthcare, software development, engineering and architecture; to plan, implement, upgrade and maintain their IT infrastructure. At ProSoft, Bryson administers all aspects of the internal IT infrastructure. With his knowledge and experience in IT, he assists customers with the licensing and installation of all Autodesk products. He also consults with companies worldwide on the planning, implementation, and training of Autodesk data management software, and especially Vault integration. Bryson can be reached for comments or questions at [Bryson.Anderson@prosoftnet.com](mailto:Bryson.Anderson@prosoftnet.com).

# Max Management Tips



## SCENE EXPLORER

One of the most obvious changes with 3ds Max® 2015 is the updated Scene Explorer, which has replaced the layer manager and gives users greater control over object level and layer viewing. Using a simple hierarchy, users have the ability to control multiple objects' child and parent relationships and nested layers in just a few simple steps. This ability to save configurations and customization makes managing a scene much simpler.

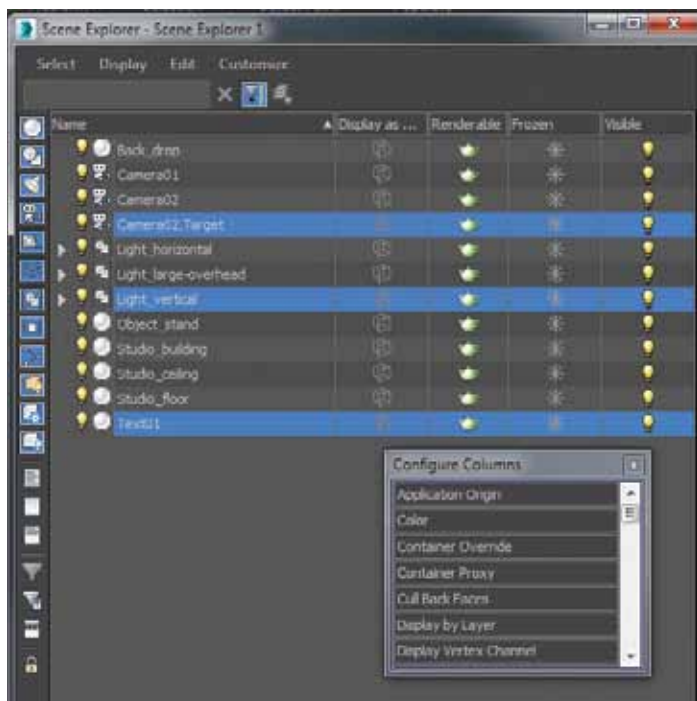


Figure 1: Scene Explorer

## FILE SIZE

Beyond tools provided by our friends at Autodesk, we can take several steps to manage our Max scenes more efficiently, reducing

both file size and render times. Take, for example, a simple teapot. A teapot left in its parametric state with 65,000 faces and 32,000 verts is saved as roughly a 212 KB file. When collapsed to an editable poly and saved, the file size explodes by more than 2,000 percent. Objects left in parametric state rely on calculations to assume their shape and composition. When collapsed, Max can no longer apply those formulas and must rely on the x, y, and z coordinates for every vertex and consider their position, rotation, and scale. For 65,000 faces, we can see how the data stored is multiplied considerably.

Instead, simply add the editable poly or mesh modifier to maintain the parametric state of the object and manage the file size more efficiently. Note that with alterations we make to verts beyond the parametric model, the file size grows with each save.

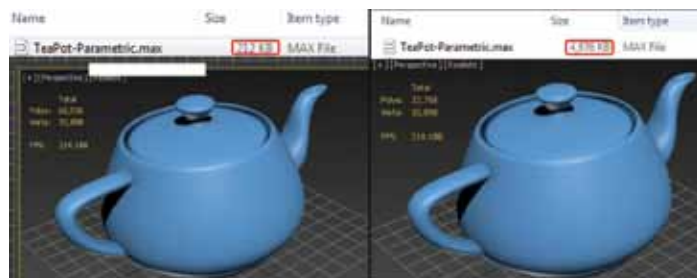


Figure 2: Teapots

## MEMORY

Rendering can strain our systems, but there are some ways to speed up rendering times or reduce the burden it has on our computers.

One option is to install and rely on cloud-based technologies. With third-party plug-ins or utilizing tools provided directly by Autodesk, we have the option to simply upload a scene (or multiple scenes) to render farms that utilize networks to speed up render times considerably. With advances in the broadband and cloud technologies, this option is no longer limited to the "big boys" and makes rendering large, complex scenes seamless and easy.



Figure 3: Sample cloud-based rendering plug-in



Figure 5: ReadyBoost

A second option is to reallocate system resources. Windows users are given the option to alter the priority and affinity in Windows Task Manager Processes. Simply by selecting the 3dsMax.exe file and right-clicking, users can increase the priority to help reduce render times (though it often limits users' ability to use the computer for much else at the same time). By right-clicking over affinity, users can allocate how many processors are dedicated to the software.

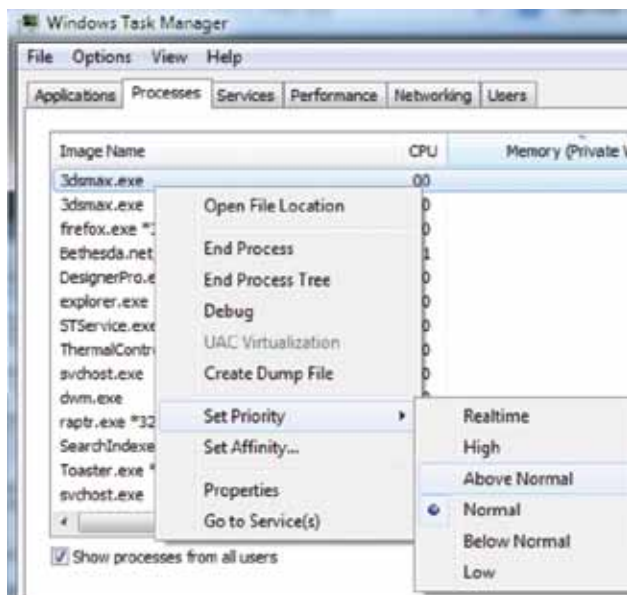


Figure 4: Processes

If you don't have a tricked-out system you might be able to take advantage of Windows ReadyBoost technology. ReadyBoost utilizes flash or memory cards to speed up computers (using a flash drive with at least 1GB of memory available).

When plugging in your flash drive (or memory card), select General options in the Autoplay dialog box, then choose "speed up my system." Here you will have the option to not use the device, dedicate the memory you would like to use to speed up your system, and more.

## A FEW MORE TIPS

Xrefing the most complicated scenes can help us maintain efficient workflows while limiting a scene's burden on a computer. Producing and managing a proper file structure and planning ahead often makes or breaks a budget.

Converting objects to proxies allows us to populate scenes with hundreds of identical objects and tens of millions of polygons while limiting the burden on computer resources and minimizing render times.

Scene alternatives can be managed with xrefs. Base objects can be stored in a single file and utilized for all alternatives.

Instanced objects can reduce system burden as well as make for efficient workflows.

As mentioned, by not collapsing objects, users have smaller file sizes with more opportunity for revisions. One disadvantage is a reduced load time. When opening parametric models with modifiers attached, Max has to construct and build those objects each time it's opened.

Compound objects (such as booleans) have the tendency to increase load times and memory size. The load time can be reduced by collapsing the objects, but will increase file size.



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# Small Business Design Data Management

**L**ast month I highlighted Flatter Files, a pretty cool company that is helping Small to Medium Businesses (SMB) with deliverables publishing. This month I am looking at how the cloud is enabling the lightweight collaborative design data management needs of some SMBs.

## WHY COLLABORATIVE DESIGN DATA MANAGEMENT?

Product Lifecycle Management – PLM

Product Design Management – PDM

Enterprise Resource Planning – ERP

Customer Relations Management – CRM

Document Management System – DMS

...and on and on.

The list is endless and quite likely you need some form of most of these in your day-to-day work. The problem is that the really useful tools are part of very large expensive systems developed by only a handful of vendors, who by virtue of their vast market share have defined the way we are expected to behave around design data.

New collaborative needs and incredible cost have forced many small businesses to rely on less capable systems, terrible data workflows, and limited features.

## WHICH FEATURES ARE IMPORTANT?

This question is the crux of the entire issue and being asked by the wrong people, namely you. In this market it should be the other way around.

Data management software is typically either too vague about how it organizes data, or too specific to one particular industry or another, and all of them require some tuning and programming to get the software to match the way you work.

...and no one wants to do all the customization.

If you are still playing 'Hansel and Gretel' data discovery with MS Office and Windows Explorer you are not alone. So why don't we all just jump out and get some data management?

One important factor is the short period between the emergence and focus on SMB PLM needs, and the sudden upswing in collaborative possibilities. "I need some PLM and PDM, but how do I include collaboration?"



Let's take a moment and completely jumble everything up. Growing trends in collaboration and market globalization, fueled by accessibility of the Internet, are pouring in data from all angles and unthought-of workflows. We don't quite know how to deal with it all yet, *and neither do the data management vendors.*

I need to catalog:

- Information, instructions, correspondence, and specifications for clients, subcontractors, and manufacturers
- Proposals, agreements, and correspondence
- Design and non-design data, including iterations, versions, and revisions
- Industry / company standards and compliance
- Visualization data
- The almighty BOM(s)
- Subcontractor orders, inspections, and correspondence
- Deliverables
- Municipal and organizational review comments
- Supplies
- Analysis data and reports

This scenario represents the least common denominator among the needs of many companies, regardless of size. All of this information must be tied together in a project type relevance, but also permitted to associate with other data inherently. This information needs to be discoverable in myriad ways, and it needs to be accessible and easy to use.

The trick is that we also need this data to be compiled between multiple collaborators that are all part of the common design process, on a globally accessible, but relatively lightweight framework.

## I LOVE A CLOUDY DAY

Did you know that the very same cloud that was demonized by so many design firms resistant to any change, is the same platform

that is making possible the cost effective, flexible management systems that the same SMB firms desperately need? Irony.

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Integration as a Service (IaaS)

The cloud solves many issues including infrastructure and platform at a substantially reduced price. All you really need to do is access the software and make it work for you.

## WHAT SOFTWARE?

There are a few companies that are working hard to fill the void. These include Autodesk PLM 360, Microsoft Office 365 and Sharepoint, Arena PLM, Aras PLM, Ally PLM, Kenesto, Siemens Solid Edge SP, CADAC Organice, Autodesk 360, GrabCAD, and more.

Almost all of these have one factor in common. They were built for companies in the SMB space to fit a wide array of workflows and needs. All have very interesting strong points, but none fit the small but broad range of needs.

### The Fusion Platform

I'd like to mention Autodesk's Fusion/Sim/CAM 360. The entire data framework was built on PLM 360 platform, enabling a single, true source with which all software can interact. Managed data would no longer require aggregation from multiple design sources. They truly have a really good overall plan to integrate all these collaborative data management needs in a lightweight framework. The raw data is not accessible enough, nor are there instrumental workflow features yet, but I love the concept and wanted to give them an honorable mention here.

### Jitterbit

Jitterbit has a wonderful service that connects your á la carte datasets in a fluid manner, but at a substantial premium. Each paid connection increases the price and brings us right back to data management costing way too much for small companies.

### Autodesk PLM 360

Autodesk went after the overall need to manage data, developing a reasonably customizable framework and really did provide a good value and easy-to-adapt data management tool. The problem was that while they included some great design workflows and controls, there are some basic refinements that need to be fulfilled, and Autodesk completely left out the design data part. There is just no realistic method to store and catalog CAD data on their cloud.

# Inventor 2015

This is understandable as Autodesk already offers CAD PDM, Autodesk Vault, to customers. Remember SMB data management is now à la carte. Jitterbit will gladly connect these two, but at an annual cost and without any collaborative features. Viewing this from the perspective of a company that has purchased Vault Professional, it does seem weird that Autodesk expects customers accustomed to transferring complex data between their CAD applications for free to pay a significant annual fee to transfer metadata between their PDM and PLM products.

## Autodesk 360's Overhaul

This product many of you know has been developed as a collaborative storage space. CAD data is easily accessed by Autodesk CAD software, and people can be invited into the space to collaborate and discuss the design. There are numerous problems from a productive design platform perspective, including the fact that the files are not easily discoverable, nor is there any method to catalog data and no real management. It's simply storage and collaboration, and it's not really comfortable to work in.

I sat in on a meeting with Sheila Wakida, Autodesk's senior product manager for the cloud, who discussed the changes that are taking place in the Autodesk 360 platform. She discussed the timeline for the year and what the company was doing with Autodesk 360.



We can look forward to better model viewing capabilities, CAD agnostic assembly and dependency detection, and integration with software and services to include things such as Dropbox and Autodesk PLM 360.

That's right. Shortly after Autodesk 360 becomes a premium service this summer, they will integrate PLM 360 in order to merge their capabilities (at this stage the service will only be available in the U.S., U.K., and Germany). That changes the scope of things substantially. Where companies would shun each product because it lacked the other's capabilities, tying them together opens up a new realm of possibilities for some.

Add in very deep search algorithms, new dashboards for situation awareness, and many more features, and Autodesk suddenly becomes much better suited to provide a useful data management solution that is accessible to small design firms.

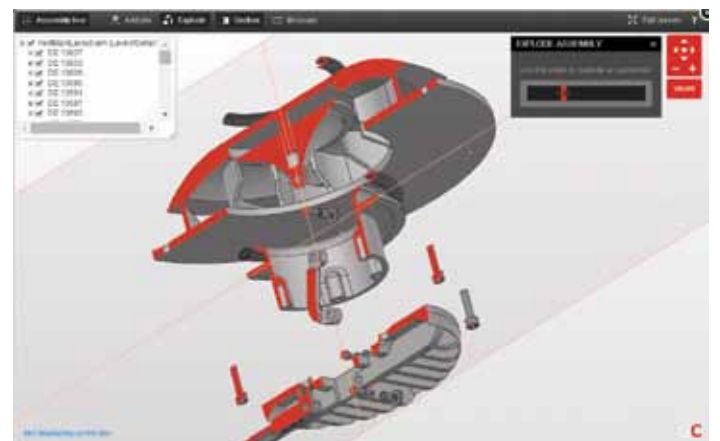
## GrabCAD

GrabCAD, developed by Hardi Meybaum and Indrek Narusk, started off as a great place to showcase your designs. It began to change into a collaborative workspace and enabler, ultimately becoming the recently launched GrabCAD Workbench.



The funny thing is that while many have discounted the new service as a novelty, the company is very aggressively developing far more robust capabilities to fill the needs of exactly who we are talking about—the SMB design companies.

GrabCAD has already licensed the Parasolid model in order to better develop the viewing and inspection capabilities. Now they are adding useful Bill of Materials (BOM) features, engineering workflows, and much more. Have you checked it out recently? Their CAD viewer is off the hook. It's worth a look to see just how useful the storage and collaborative space is at this point before all the changes begin to form.



## Cadac Organice

Cadac Group specializes in providing IT solutions to create, manage and share digital design information. That sounds pretty close to what we are talking about.

This team has been aggregating CAD storage and data for some time on SharePoint, and are leveraging that on their hosted SharePoint Cloud. They have vast knowledge and experience in dealing with CAD model data management and have already been



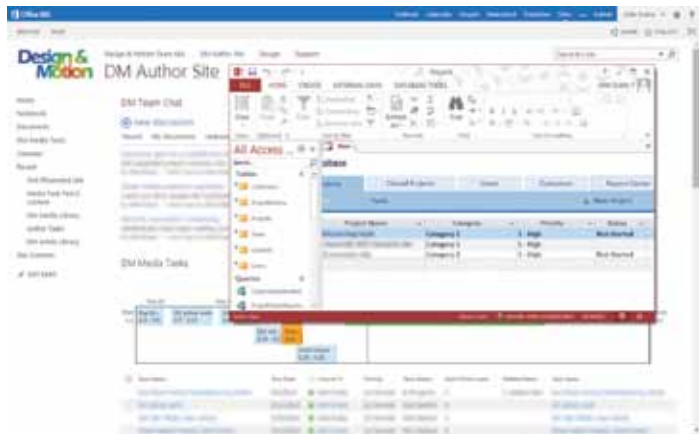
involved in Inventor upload add-ins. I am very much hoping for a design- and manufacturing-specific SharePoint app release for Office 365 Small and Medium business in the near future.

## SharePoint and Office 365

SharePoint, as part of Office 365, is emerging as a real contender for the small design market. How is that? SharePoint sucks, right?

Well, yes and no.

The SharePoint interface itself is clunky, not really design component or process related, and it is still a collection of poorly joined resources, but let's look at it as a platform instead.



Every purchase of Office 365 Small and Medium Business gets you a SharePoint cloud site and a large amount of storage. The current version is 2013 and has been substantially cleaned up, which makes it reasonably functional.

- Easy to use and pre-configured collaborative and project management spaces
- Document versioning and control
- Smooth Outlook and Office integration are valuable tools as well
- Pre-configured, streamlined Exchange servers on Microsoft's Azure server
- Tons of storage with triple redundancy backups

...at no additional cost to your Office licenses. That means that almost every licensed user will have access to a SharePoint cloud site, all their collaboration and records, and their versioned data files in a controlled and secured environment.

Get this: As one Microsoft engineer told me, you can license only the in-house seats you need, but invite the entire world to collaborate with no additional cost. This is hugely significant, considering that other services require each invited collaborator to occupy one of your paid seats. Microsoft is pushing collaboration on SharePoint hard.

Also, Microsoft is heavily investing in the SharePoint App approach, where companies can develop custom apps that run inside the SharePoint team-site envelope. This means that third-

party vendors can develop well-customized data, forms UI, and workflows that can leverage the existing data structures, managed storage, and collaborative spaces, and provide design firms with a powerful, well-rounded solution.

All the SMB design industry needs is a solid third-party SharePoint application and it'll be on like Donkey-Kong.

## WHY IS 2015 SIGNIFICANT?

I believe that 2015 will be the baseline for the SMB data management service. Companies are racing to develop useful tools that are reasonably CAD agnostic, and meet the collaborative, aggregate, storage, discoverability, and accessibility needs that have become so evident in the last few years.

What is more important is that the company that delivers a complete, easy-to-use, extremely configurable deep-search tool that stores, catalogs, aggregates, and secures design models and data, with customizable form UI and accessible storage and delivery pipeline by the end of 2015 will set the stage for how small companies will collaborate, and will shape the way we work in the near future.

Will GrabCAD, with its beautiful collaborative and viewing interface, bring enough management tools to the party? Will Autodesk 360's integration with Autodesk PLM really tie together all the parts we need in a useful, non-frustrating way? Will one of the fledgling data management vendors put together a comprehensive SharePoint Cloud app that better aggregates data and offers CAD model viewing?

If any of these things occur, I will likely be the first one to purchase seats.



John Evans is an Autodesk Certified Inventor Professional living in the Florida Panhandle, where he provides technical troubleshooting at Gustin, Cothorn, and Tucker, Inc. His career through the Aerospace Design, manufacturing, and maintenance spans 24 years and includes a tour in the USAF. John now works as a design consultant and author from his company John Evans Design and manages the blog "Design and Motion", where he combines his passions: Autodesk Inventor, simulation, and motion control. He is a regular attendee of Autodesk University and has recently joined Tekni Consulting as a contributing author for the Creative Inventor training series. He can be reached at [john@johnnevansdesign.net](mailto:john@johnnevansdesign.net).

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